THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
June 5, 1989 · Vol. XXIII · No. 23 · 116 Pages · Section 1 of 2 · $2/Copy · $48/Year

COMPUTERWORLD

INSIDE

IBM hot for DB/2 converts

BY AMY CORTESE
CW STAFF

IBM has stepped up efforts to convert non-DB2 users to relational ways. However, the renewed conversion campaign is targeting customers of IBM's competitors rather than its own large installed base of IMS users.

Many users faced with the daunting task of moving long-term investments in software from older databases to DB2 have resisted, choosing instead to maintain two databases. Although IBM seems to recognize this dilemma and is encouraging coexistence between DB2 and the older IMS, the company has focused its effort to swing users of non-IBM database management systems to DB2.

Cullinet Software, Inc.'s IDMS and IDMS/R were the first targets of an IBM conversion campaign in April, when IBM invited hundreds of IDMS users to its offices throughout the U.S. to view a telecast on IDMS-to-DB2 conversion. The

Continued on page 6

Systems snafu stuns Sun

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — It built computers for the world, but Sun Microsystems, Inc. failed to properly install a powerful mainframe system to run its own $1 billion-plus business.

Last week, the company admitted that a botched cutover from a Hewlett-Packard Co. minicomputer to an IBM-compatible mainframe complex threw a monkey wrench into Sun's bustling business, delaying thousands of orders. As a result, Sun acknowledged that it may post its first quarterly loss since it went public in 1986.

Sun held a nationwide telephone press conference in New York after the close of trading Thursday to warn Wall Street that fourth-quarter revenue may fall below the $497 million mark posted in the third quarter. That result would be "significantly" below the fourth-quarter sales for the corresponding period in 1988, Sun said. But Scott McNealy, chief executive officer, claimed the bad news would not persist beyond the current quarter ending June 30.

Bellwether users said their confidence in Sun has not been shaken by the news. Frank Duquette, technology director at Greenwich Capital, acknowledged that his company has seen delivery delays of up to 30 days on Sun products. "But it doesn't alter our confidence in the company," he added, echoing the sentiments of other users.

McNealy cited several factors leading to the expected downturn in sales and profit. Although internal systems problems were tagged as the main culprit, he said those and other factors call into question the ability of the Sun management team to keep pace with the company's meteoric rise over the past several years.

Another factor, McNealy said, was the April 12 introduction of five new products, which greatly increased the complexity of internal billing, ordering and shipping. In an interview with *Computerworld* two weeks ago, however, he made no mention of the company's impending problems (see story page 81).

"It's bound to happen — any time a plane climbs as fast as Sun Microsystems does, it can begin to shudder and to shake . . . and you hope the wings don't fall off," said Richard A. Shaffer, editor of "Technologic Computer Letter." "Sun is involved in so many different markets, in so many different opportunities.

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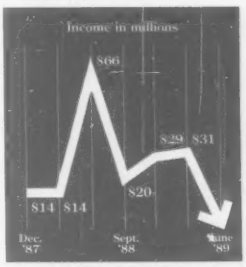
Down to earth

After enjoying years of record growth, Sun fears it may see a loss this quarter



SOURCE: SUN MICROSYSTEMS, INC. CW CHART

Feds whack hacker ring

BY MICHAEL ALEXANDER
CW STAFF

Little Silence just didn't know when to shut up.

In the first few months of 1989, the computer hacker allegedly made hundreds of unauthorized telephone calls to some 60 corporate voice-mail computer systems across the U.S., including 332 calls in one month to a computer system operated by a real estate firm in the Chicago suburbs. Once inside the systems, the hacker would allegedly exchange illegally acquired company credit-card and long-distance calling-card numbers with other hackers, federal law enforcement authorities said.

Now, Little Silence and at least seven other reputed hackers are the targets of a four-month-long investigation that has involved the U.S. Secret Service; the Federal Bureau of Investigation; state and local law enforcement officials in several states; the Royal Canadian Mounted Police; and security and information systems personnel at several telecommunications companies, including AT&T, U.S. Sprint Communications Co., MCI Communications Corp. and nearly all the regional telephone companies.

As many as 50 hackers with Little Silence's reported propensity for invading voice-mail computer systems are believed to be involved in a nationwide scam to steal telephone and computer service and to illegally traffic

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FOREIGN ACCENT

IS seeks opportunities as a united continent looms

"We should all be concerned about the future because we will have to spend the rest of our lives there."
Charles Franklin Kettering
Seed For Thought

BY JAMES DALY
and ALAN J. RYAN
CW STAFF

David Mattson may spend his working hours deep in the concrete canyons of Manhattan, but his thoughts have increasingly carried him across the waves to Europe.

First, he must coordinate Sterling Drug, Inc.'s changeover there from a bisynchronous communications network to IBM's Systems Network Architecture. An order processing system must also be beefed up for more accurate tracking of when and where his product leaves the shelves. Also popping is the use of universal product codes and such new functions as electronic data interchange.

Why this preoccupation with the Old World? When the bells toll at midnight on Dec. 31, 1992, the economic vagaries that have shackled the European business community for decades will be declared legally dead. Mattson and hundreds of IS manag-

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IN THIS ISSUE

CD-ROM is making its mark in IS with in-house publishing applications. Page 75. ▶

ARCHIVE

This week is one for the legal historians. Eight years ago, IBM and the U.S. Department of Justice rested their cases after 12 years of antitrust litigation. Seven months later, the Justice Department dropped the suit. In 1978, Congress prepared to consider a "deregulatory" revision of the Communications Act, not knowing how deregulated that business would become. In 1982, a former IBM employee went on a shooting rampage in Bethesda, Md., killing two IBM employees. And in 1985, a California jury ordered NCR to pay $5.8 million in damages for misrepresenting one of its systems to a customer.

◀ *Stephen Morse does not dream about work group computing, he builds it. Page 57.*

ART: TERRY ALLEN
PHOTO: JOYCE RAVID

EXECUTIVE BRIEFING

■ **Some leading-edge IS organizations are making their plans today** for the 1992 easing of trade restrictions in Europe. The chief business forces expected to shape IS management for the 1992 switchover include a rearrangement of resources, the need for improved communications and the ability to handle expanded business throughout the European Community. **Page 1.** Last week, GE positioned itself for 1992 when it outlined its global network plans for the coming decade. **Page 109.**

■ **IBM is trying to drive mainframe shops into the relational world of DB2** through a new promotional campaign. But the effort targets users of IBM competitors' database management systems, not those running IBM's own nonrelational IMS product. **Page 1.**

■ **The take may have been as high as $1.5 million,** said investigators who broke up one of the first voice-mail computer fraud rings. Eight hackers allegedly used voice mail and computers to bilk firms. **Page 1.**

■ **Two seemingly unrelated trends** — the growth of systems integration firms and the move toward downsizing — are converging. Surprisingly, systems integrators seem to be continuing their focus on mainframe applications despite the handwriting on the wall. Efrem Mallach takes a look at the implications of the merger of these trends in his Viewpoint column. **Page 21.**

■ **President of Sun Microsystems, Scott McNealy,** is blaming IS failures for his firm's problems — as he stares at plummeting earnings figures. **Page 1.** But he is still touting his company's Sparc technology and Unix as gospel for the computer industry. **Page 81.**

■ **Local IS organization luncheons may have a reputation for blue meat** and boredom, but there may be added benefits to getting out of the office for a couple hours every month to attend such a function. Robert Hargrove tells how to traverse the lunch circuit and come away with something worthwhile. **Page 21.**

■ **Could the growth of end-user computing** mean an expansion rather than a contraction of the scope of the IS function? Research by The Diebold Group indicates that may be the case. **Page 37.**

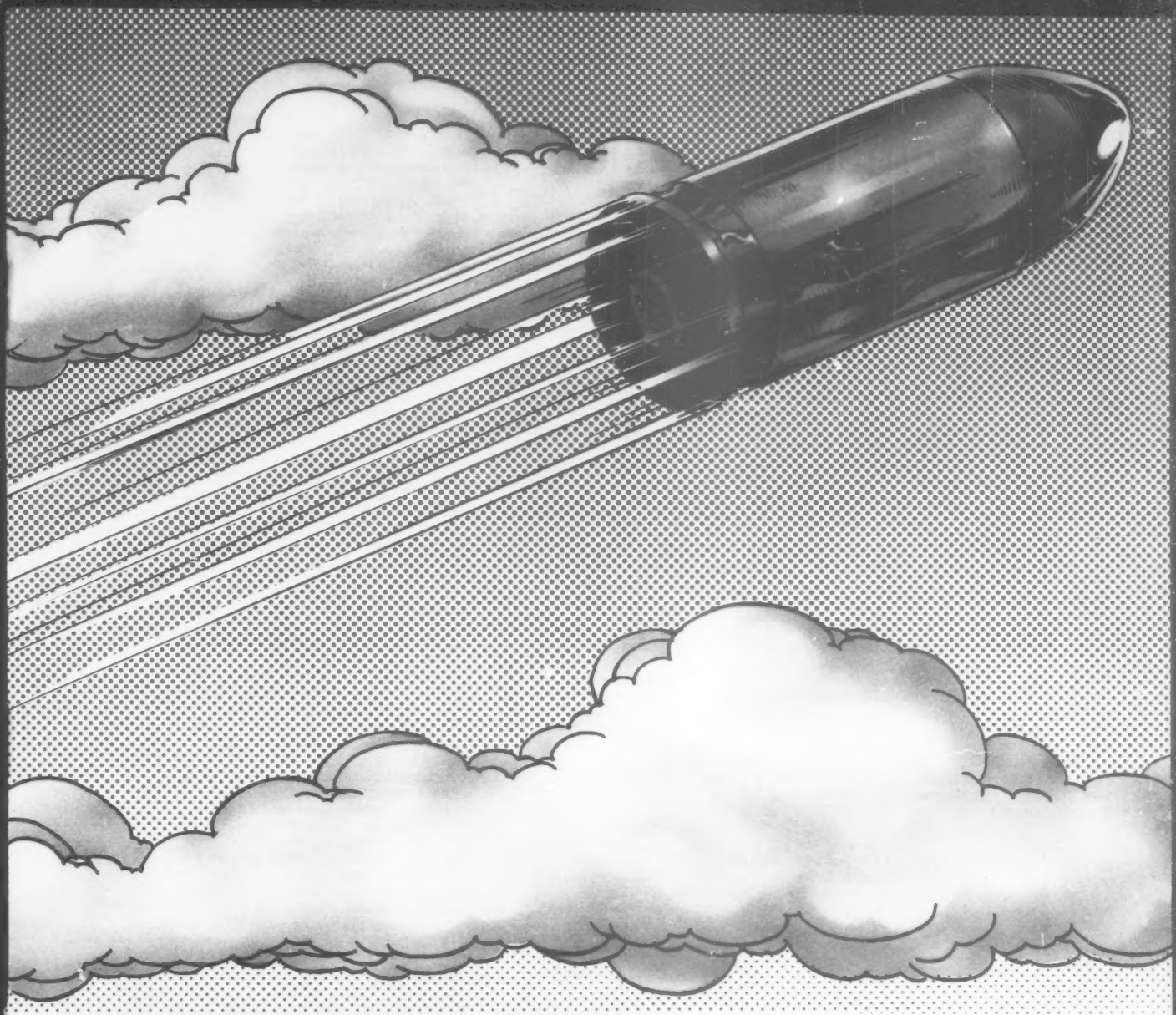
■ **A $1 million transaction processing benchmark procedure** put Tandem Computers over the top in a competition with IBM for a key contract with the California Department of Motor Vehicles. **Page 23.**

■ **It's been a "maturing technology" for four years.** Now, CD-ROM is finally making its way into the mainstream computing world. There is a ground swell of CD-ROM activity behind the scenes at Fortune 1,000 companies and government agencies, which are using CD-ROM as a strategic information management tool. They are managing and distributing massive amounts of critical, internally published information such as policy manuals, product catalogs, documentation, management reports and market research. **Page 75.**

■ **Work group computing** may be more of an ideal than a reality, as most organizations struggle to define what it is and what it will require. **Page 57.**

■ **The technical advances in telecommunications** that large organizations take advantage of are also putting those business and government organizations at risk. They are becoming more and more vulnerable to natural and man-made disasters, according to a federal report. **Page 41.**

■ **IS professionals have to take the Renaissance man approach** to their careers and see the many facets of the profession, according to ASM's new President James W. Prickitt. **Page 49.**



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All that glitters is not gold

Net heavies try to dazzle Drexel — but with a few strings attached, of course

BY ELISABETH HORWITT
CW STAFF

NEW YORK — In its quest to consolidate resources and cut costs, Drexel Burnham Lambert, Inc. has put itself up for grabs in the rapidly escalating turf war between the three major long-distance carriers. MCI Communications Corp., AT&T and U.S. Sprint Communications Co. are wooing the cost-conscious Wall Street firm with whopping discounts and carte blanche network management solutions.

However, the strings attached to such offerings are likely to tie up Drexel's communications budget for years to come, company spokesmen said.

Drexel's dilemma is a familiar one for Fortune 500 service firms whose informational life blood runs through their networks. Upper management wants to slice $12 million, or about 10%, off Drexel's annual telecommunications budget and increase reliability at the same time.

To accomplish this, the communications department formulated the plan of consolidating voice and communications over a single intelligent network backbone. The question is whether to go with carrier services or a private network.

Drexel does not feel ready to internalize responsibility and take charge of its own network. However, it is unsure whether a vendor can ensure acceptable reliability and response-time levels — at least at a reasonable cost, said Charles Koman, vice-president of communications. "They say, 'For the right price, we'll do everything,' but we don't know the price yet," he explained.

A raw deal

AT&T has been sending the same message to all its major accounts, according to Koman — namely, " 'Our business is being eroded; we'll deal if you commit a major portion of your business.' "

Meanwhile, Sprint and MCI, which had previously concentrated on taking bites out of existing accounts, are responding to AT&T's Tariff 12 offerings and cuts to regular services with special deals of their own, saying in effect, " 'Oh, yeah? We'll try to take it all away, then,' " Koman added.

The escalating competition has proved a mixed blessing for Drexel. All three carriers came back with promises to cut between 35% and 45% off the investment firm's current budget, "which surprised us," Koman said. "We hoped for 20% to 25%."

However, the vendors wanted multiyear agreements that included penalties for failure to meet certain revenue thresholds, Koman said. "We weren't comfortable with this," he said.

As a result, Drexel has initiated a second round of negotiations around commitment levels. The firm hopes to decide which network provider or providers to go with by the end of this month, Koman said.

Drexel's Koman *expresses skepticism toward the vendors*

While it bargains with the carriers, Drexel has a "parallel project going" to evaluate private networking — and particularly network management — solutions, Koman said. "We want to see how much network management we can do with the people we have and canned network management software," he added.

Among the products under consideration are AT&T's Unified Network Management Architecture (UNMA), Timeplex, Inc.'s Timeview and IBM's Netview.

Most likely, "there will be two ways to view the network — Netview or UNMA — with a door open to migrate more fully into either system," Koman said. Netview will definitely not be the overall system, at least for a while, because 90% of the company's traffic is voice-oriented, and IBM's system will probably not be able to handle telecommunications devices effectively for about five years, according to Kam M. Saifi, assistant vice-president of communications planning.

Drexel wants a management system that can take a lot of the grunt work off communications managers' shoulders, Koman indicated.

"We want a lot of redundancy and a network that heals itself," he said, because Drexel sites do not send "a lot of low-priority stuff.

"We won't be able to say, 'If I lose this, I can bump that.' It's all hot," he added. The goal is for the system to "take the heat off work centers in terms of fixing immediate failures," Koman added, freeing managers up for more active work such as anticipating and fixing response-time problems before they become serious.

Consolidated network management will also give communications managers "the big picture" of network usage, he said, potentially allowing them to pinpoint ways to cut costs in a systematic, comprehensive way. For example, the department only recently consolidated billing for various departments' usage of packet-switching services, discovering that Drexel qualified for a volume discount. Total savings so far amount to $200,000.

Space shuttle computers need a high-tech boost

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. space program may be known for its dramatic advances in technology, but a revealing study by the U.S. General Accounting Office (GAO) has found that the computer technology inside U.S. spacecraft is often 8 to 20 years old.

Take the space shuttle. The personal computer on your desktop probably operates faster and has more memory than the shuttle's on-board computers, the GAO said.

The space shuttle uses AP101 processors — a militarized version of the IBM 360 technology introduced in 1964 —featuring a 16-bit microprocessor running at 400,000 instructions per second (0.4 MIPS) and 104K bytes of random-access memory.

The problem is that although the space shuttle was first flown in 1981, the computer system was chosen for it in 1971, the GAO said.

The National Aeronautics and Space Administration plans to use its first 32-bit architecture in the orbiting space station, which will use the Intel Corp. 80386 chip. Of course, by the time the space station is launched, in 1995, the 386 will be 10 years old.

Four reasons

GAO and NASA officials said there are four main reasons for the technology gap:

- Computers must be modified to withstand a harsh space environment, including exposure to radiation, high-energy particles and extreme temperatures, in a lengthy process known as space qualification.
- Because a spacecraft's computer is such an integral part of the design, NASA chooses a computer system early in the development stage.
- NASA managers tend to be conservative, selecting older computers with proven reliability.
- After computers are selected and installed, spacecraft launch dates may be delayed by several years.

One result of the technology gap is that NASA must scale down its space missions to those that can be supported by the old processors, the GAO said.

For example, the unmanned land rover expected to explore Mars in 1998 may be restricted to traveling a total of only four miles in 235 days as a result of computer limitations.

"The question is whether NASA can develop and deploy newer, more powerful computers quickly enough to support its ambitious plans for future missions," the GAO said. Future space missions will require processors capable of 10 to 25 MIPS to control robots and process streams of observation data.

Robert Rosen, deputy chief of NASA's Office of Aeronautics and Space Technology, said NASA is aware of the problem with outdated computers and is taking steps to reduce the technology gap.

One year at a time

However, "it is unreasonable to expect to see the technology gap reduced significantly below the four to six years required to space-qualify computers," Rosen said in the official NASA response to the report.

Rosen noted that, in addition to ongoing research programs to develop special-purpose computers and optical data storage systems, NASA has decided to use the 16- and 32-bit space computers that are being developed by U.S. defense agencies for the Strategic Defense Initiative.

An IBM Systems Integration Division spokeswoman working with NASA in Houston said that while the AP101 and AP101-S have origins in the IBM 360, they do not use the same processor technology as the 360. "They are many generations away from the 360. They are specialized avionics processors that have custom architectures," she said.

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NEWS SHORTS

IBM produces quick chip

IBM claimed last week to have made the world's fastest 1M-bit dynamic random-access memory chip. The chip, manufactured at the firm's Yasu, Japan, plant, reportedly retrieves a unit of information in 22 billionths of a second, a rate at least twice as fast as the current 1M-bit chips. The chip was manufactured using a new CMOS process developed at the Yasu laboratory. IBM scientists from the Thomas J. Watson Research Center in Yorktown Heights, N.Y., collaborated on the effort.

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California bust?

The economic slump that hit Silicon Valley in 1985 and '86 caused the average wage in the high-tech industry there to drop compared with levels of 17 years ago, a recent study concluded. The inflation-adjusted wages per worker were $25,990 per year in 1988, down from their 1972 level of $27,793, according to the report from the Association of Bay Area Governments.

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Control Data Institutes sold

Continuing the cost-cutting it began in April with a $490 million restructuring change, Control Data Corp. last week sold its education units, the Control Data Institutes and the Institute for Advanced Technology (IAT), to Human Capital Corp. in Edina, Minn. A newly formed company, Human Capital plans to operate 28 vocational and technical schools in the U.S. and Canada under the name CDI Career Development Institutes. The organization will operate the IAT seminar business under the present name. The two businesses serve 18,000 attendees annually, CDC said. Terms of the cash sale, scheduled to be completed this summer, were not disclosed.

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Japanese changes urged

In what may be viewed abroad as a long-overdue policy, Japan's Ministry of International Trade and Industry yesterday issued its industrial policy report for the 1990s. The report focuses on competition without friction, emphasizing the adoption of global corporate strategies by Japanese companies so that they are better able to fit in at overseas locations, international standards in key markets and better multilateral cooperation with trading partners. To relieve trade friction, the report said that Japan needs to introduce rules that will make it easier for foreigners to access markets in that country (see story page 18).

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AT&T names integration head

John Miller has been promoted to executive vice-president of Product Business Units for AT&T Paradyne, the vendor's data communications equipment subsidiary. As head of research and development and marketing within the organization, Miller will direct the vendor's effort to integrate its various data communications equipment lines under the Unified Network Management Architecture platform. Frank Ianna will replace Miller as director of development and network management for the Business Communications Services unit.

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Leading Edge deal closer

Daewoo Telecom Co. last week signed an offer to purchase the financially troubled Leading Edge Products, Inc. The paperwork is expected to be presented to a bankruptcy court judge on June 9, according to an associate of Stephen Gray, the court-appointed trustee for Leading Edge. The terms of the agreement are subject to a vote by the company's creditors and final confirmation by the judge, the associate said. The process is expected to take at least 30 days.

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Blaze closes data center

A fire last week shut down Penn Mutual Life Insurance Co.'s Philadelphia headquarters and forced the company to run computers from a commercial disaster recovery hot site. Applications, which normally run on two IBM 3081 K mainframes, were running at the hot site the next day.

Users cool to EMC 3090 memory extensions

BY ROSEMARY HAMILTON
CW STAFF

HOPKINTON, Mass. — First EMC Corp. tried to do 3090 memory cheaper than IBM. Now, it is trying to do it better. Even still, users are slow to warm to the third-party provider.

Last week, EMC offered users twice the amount of memory that IBM provides on low-end 3090 E models while also offering an asymmetrical capability for them. IBM offers the asymmetric feature— which allows users to configure memory in different amounts on the two sides of a processor complex — on 3090 S models only.

While analysts last week viewed this step as positive, 3090 users were not quite as upbeat. Some 3090 shops said EMC's actions were interesting, but they continue to express doubts about doing business with anyone other than IBM when it comes to their 3090s.

"I view it as scary because you'd have to play around with the system a bit to do this," said John Wood, director of computer operations at the Royal Bank of Canada in Toronto.

Jeffrey Goldberg, vice-president of sales at EMC, said both options require minor changes to the system parameters, which tell the CPU how it is configured. Goldberg said that the low-end E models were designed to accommodate the additional memory, but IBM has established a lower amount as the maximum to encourage upgrades. So EMC needs only to change the parameters that tell the system how much memory it has.

Waiting for IBM

Others are not so sure. Cambex Corp., another 3090 memory provider, said it does not plan to take any of these steps until IBM does.

Wood said he agrees that IBM's memory limitations are marketing-driven, but "violating the system's architecture isn't the solution."

But with EMC's plan, users interested in an asymmetrical capability do not have to move to the S processors. The offer of twice the memory on two low-end E models, the 180E and 280E, could be a boost to users who need more memory but do not want to spend the money to upgrade their processors.

EMC said it will install up to 128M bytes of central storage and 512M bytes of expanded storage on the 180E. It will also install up to twice the amount of memory on the 280E by configuring up to 256M bytes of central storage and 1G byte of expanded storage.

"It sounds attractive, but I'm not sure the 180 would give you the power to drive that extra memory," said Carmine Melito, senior product analyst consultant at Allied Signal, Inc. in Morristown, N.J.

David Vellante, an analyst at International Data Corp. in Framingham, Mass., said EMC's offers could help users get around IBM's limitations, which are strictly marketing-driven.

DB2 converts

FROM PAGE 1

telecast coincided with the publication of an IDMS-to-DB2 conversion guide and a promotion offering discounts and incentives to new DB2, SQL/DS and Cross System Product customers.

Similar blitzes are scheduled within the next few months for Computer Associates International, Inc.'s Datacom DB, Software AG of North America's Adabas and Computer Corporation of America's Model 204.

Russ Donovan, database marketing support manager at IBM's Applications Enabling Marketing Center, said a big selling point for DB2 is its key role in IBM's Systems Application Architecture scheme. In addition, he said DB2 users gain the benefits of relational technology over older, nonrelational products such as IDMS.

IBM cites the costs of maintaining two DBMSs as further reasons for undertaking a conversion. However, users who keep IMS and DB2 must still pay for both.

While the company stresses that all new applications should be developed on DB2, it is pouring resources into making its IMS coexist with DB2. Donovan denied that converting from IMS to DB2 is unduly complex but said conversion was not necessary because the two databases can work together.

Nonetheless, there are obvious marketing reasons why IBM would not want its customers to migrate from IMS. "From an account management point of view, it's to IBM's advantage having customers use [IBM's] database," said Charles Bachman, president and founder of Bachman Information Systems in Cambridge, Mass. He noted that customers with IBM DBMSs are also major users of other IBM equipment, such as direct-access storage devices.

Robert Weiler, president of Cullinet, stated that his firm's customers are not interested in replacing IDMS but rather in coexisting with DB2. Weiler characterized the conversion process as "a bear," adding that IBM's conversion guide is "essentially how to rewrite all your applications in DB2." Weiler said that although Cullinet does not offer coexistence facilities, it plans to do so.

However, one Cullinet user, Gail Port, vice-president of product development at Citibank's North American Finance Group in New York, is gradually replacing IDMS with DB2. Although some IDMS databases are being redesigned and converted to DB2, in other cases, the conversion will be gradual.

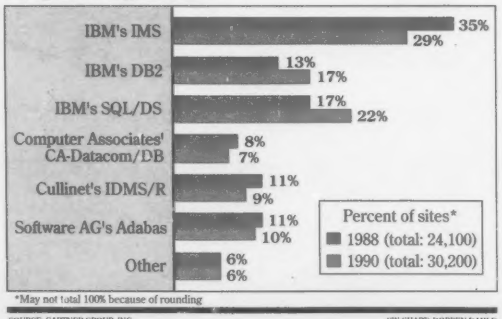
In contrast, a user at one large manufacturing firm that contributed to the publication of the conversion guide said that while the cost of maintaining two databases might justify a conversion for a smaller shop, for a big shop "it's not cost-effective to change for the sake of changing." The user, whose company preferred to remain anonymous, said that DB2 currently lacks features that IDMS and IMS have, such as row-level locking.

Although new development at the company is being done on DB2, about 90% of the firm's applications are IDMS-based.

Senior Editor Stanley Gibson contributed to this report.

Chiseling away at the competition

At the expense of others, DB2 is projected to gain ground in installed base among IBM 370-type DBMSs



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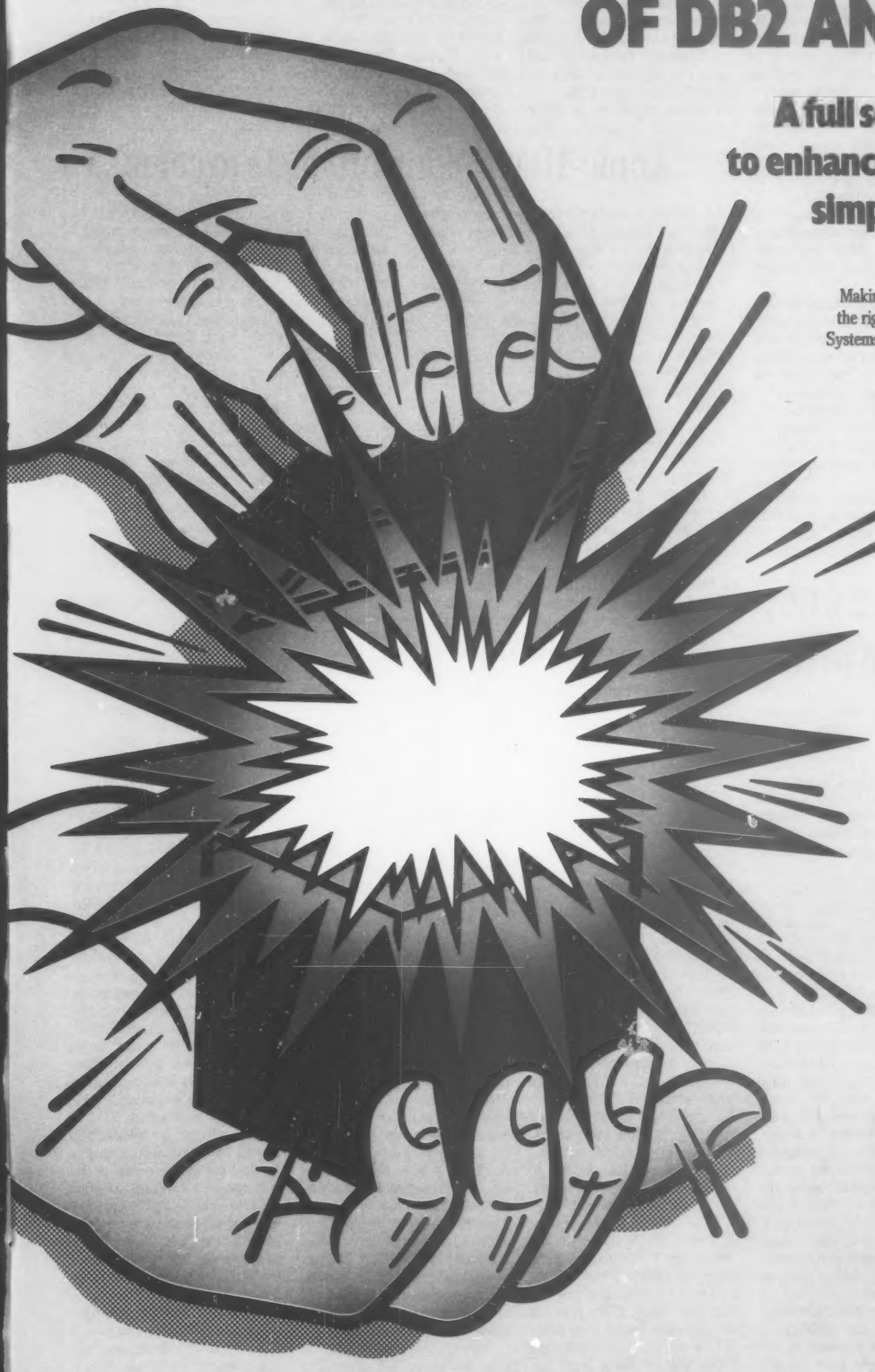

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Apple mounts big network wave

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Apple Computer, Inc. will open the floodgates next Monday, unleashing a wave of IBM and internetworking communications products designed to pump up IS interest in its Macintosh workstations.

The sometimes pricey lineup, which is supposed to position Apple as a full-fledged supplier to enterprise networks, may disappoint IS managers seeking to directly connect the two environments. If this happens, Apple could again fail to attract those accounts analysts say it needs to gather in the Fortune 500.

A gateway approach to Token-Ring connectivity based on a $1,200 Tokentalk card may not appease corporate users with a few stand-alone Macs among many PCs. They will find the cost "extremely outrageous," one analyst said.

"It's overpriced, I'll grant you that," said Price Collins, program manager at General Electric Co.'s internal network.

This situation could prove particularly dicey for Apple in view of IBM's Officevision [CW, May 15 and 22], said consultant Andrew Seybold, president of Computer Insider. "Officevision will make it harder to justify a Mac than ever before," he predicted. Users who want the Mac's graphical interface will find IS managers touting Officevision's graphics and ability to tie seamlessly into IBM hosts.

What users can expect from Apple is a heavy concentration on gateway, 3270 and internetwork products (see related story at right).

Appletalk enhancements that significantly increase the number of nodes supported are welcomed by many Ethernet users. "Improvements to Appletalk would have immediate impact," said Mike Bailey, a systems integrator at Lockheed Missiles & Space. Bo Pitzker, a system administrator at Pacific Bell Directory, concurred: "When you plug into Ethernet, which can extend Appletalk for miles, you can easily exceed 254 nodes."

Less pricey is a quartet of third-party announcements:

- Spectrum Systems in New York will unveil a Mac version of its Xcom 6.2 file-transfer software. A version for OS/2 Extended Edition costs $950.
- Cayman Systems in Cambridge, Mass., reportedly will unwrap a Localtalk-to-Token-Ring gateway.
- Assante Technologies, Inc. in Sunnyvale, Calif., is expected to introduce a Token-Ring card for the Mac II for about $800.
- H-Three Systems Corp. in Research Triangle Park, N.C., will introduce Macring, the first in a family of Token-Ring cards for the Mac SE, SE/30 and II that will support IBM's 3174 and Token-Ring Interface Coupler. Compatible with Novell, Inc.'s Netware, Macring for the SE is available now for $795.

Assante and H-Three's pricing is more in line with the typical cost of a Token-Ring card for PCs, which averages about $600 to $700. The long-overdue Tokentalk card will cost as much as $500 to $600 more.

Apple-IBM linking products to come

Apple will boost its IBM connectivity by unveiling the following options June 12, sources said:

Tokentalk NB Adapter — The 4M bit/sec. Nubus-based card resides in either a server or workstation. IBM Server Message Block protocol support allows file transfer between Macintoshes and PCs. Priced at about $1,200, it is scheduled to ship in the third quarter.

Appletalk 2.0 — This system software reportedly will support up to 65,000 nodes. It is available now, possibly as a free upgrade.

Appletalk Internet Router — This product reportedly can tie up to eight Appletalk networks together into a virtual network; multiple routers can be linked together. Pricing is about $500 with immediate delivery.

Mac APPC — First announced in early 1988, the LU6.2 software works with Tokentalk to allow Mac applications to talk with programs that support IBM's LU6.2 running on Token-Ring. It is slated for third-quarter delivery.

MacX25 and **Macpad** — Software links Macs to X.25-based packet-switched networks. Users can use a single workstation or the server as an entry point to the wide-area network.

3270 connectivity — Two products that can work together, **Mac DFT** terminal emulation and a **Coax/Twinax Card**, will expand Apple's 3270 support. The DFT software supports up to five 3270 sessions and file exchange between the two environments. The dual-mode adapter works with 3270 software to enable the user to talk to computers on an IBM Systems Network Architecture network. The card costs $1,500, and the software $300; both ship next quarter.

3270 API — Apple will unwrap its own 3270 application programming interface, which supports High-Level Language Application Programming Interface. Digital Communications Associates, Inc. and Avatar Corp. — which have similar application programming interfaces — have pledged support, sources said.

Serial NB Card — A board-level controller with four serial ports, it supports up to four IBM Synchronous Data Link Control sessions. An on-board processor handles protocol conversion between the Mac and host. Third-quarter delivery is expected.

Appleshare PC 2.0 — This enhancement expands file server support for MS-DOS to any adapter compatible with Apple and Novell, Inc.'s Multiple Link Interface driver. The $149 package ships in the fourth quarter.

Ethertalk upgrades — These provide compatibility with Appletalk 2.0 and the IEEE 802.2 standard but are not backward compatible, according to sources. Included is a version for Macintoshes running AU/X. Fourth-quarter delivery is expected.

Also expected is X Window System support and CL/1 server products for MVS and VMS.

PATRICIA KEEFE

MAI back to square one, scales down Prime offer

BY NELL MARGOLIS
CW STAFF

MAI Basic Four, Inc. decreased its $20 per share offer for Prime Computer, Inc. to $19.50 last week, sending one of the computer industry's most convoluted hostile takeover attempts back to what analysts view as its misbegotten beginning.

"It's right back to square one," said Stephen Dube, an analyst at Shearson Lehman Hutton, Inc., referring to the more than 6-month-long battle over Prime as "Soap Opera, Part 16."

Where does this leave the parties? "It's a puzzle," said Jay Stevens, an analyst at Dean Witter Reynolds. The Prime/MAI affair, he added, "has gotten so murky that it's hard to make any meaningful statements, much less predictions."

On May 15, Prime Chairman David Dunn challenged MAI Chairman Bennett LeBow to make good its vaunted $20 per share — or $970 million — offer by June 2 or call it off. To give MAI a shot at achieving its goal, Prime temporarily removed a series of legal impediments to the tender offer, including a so-called poison-pill provision. MAI replied only that it was evaluating all aspects of its offer.

A day before the deadline, MAI amended its offer. In addition to the lower purchase price, which extends only to outstanding shares — about 75% of Prime's total — the new deal proposed that the remainder be exchanged for MAI debentures. Prime replied tersely that its board will meet to consider MAI's latest terms but with "serious reservations about the revised offer."

When Prime issued its mid-May ultimatum, analysts noted that any retreat from MAI's original offer would be seen as a sign that the company could not raise the money necessary to complete the deal.

Also, analysts agreed, the situation will revert to its pre-May 15 status, with the players in legal battles and fast approaching a proxy fight, slated to take place when Prime holds its annual stockholders' meeting June 14.

MAI's markdown of Prime, Dube said last week, triggered just such an unfortunate scenario. "The market shrugged the [restated] offer off," he said. The fact that MAI's perceived back-off is comparatively minor, from the financial viewpoint, disconcerted rather than reassured market observers, he said. A more significant reduction might have taken MAI out of the game; a cash-backed renewal of the $20 offer might have handed them a victory. As it is, Dube said, "we're going to go down to the wire on this one."

Sun

FROM PAGE 1

The biggest danger is that management is going to be stretched too thin."

Regarding the systems problems, McNealy said Sun installed an Amdahl Corp. 5890 Model 190E, a National Advanced Systems AS/XL50 and a NAS AS/EX70 last year and started testing new applications for a planned conversion.

"For the last six months, we ran the systems in parallel, sending application data back and forth. But at some point you've got to unplug the old system and plug in the new one. Then you look for the little brushfires, and you put them out," he said.

"The Cullinet transition cost us time," McNealy went on. "We weren't able to stop time while we switched over. It's a matter of a week or two loss, but that can swing a big revenue number when you're growing as fast as we are. It's a tightrope we've walked because of our [high] growth rate."

Robert Weiler, Cullinet's president, said of the Cullinet Manufacturing System, "Implementation is a complex process. Sun is a valued customer for Cullinet. We supported them during this implementation, and we will continue to do so."

For two to three weeks after the cutover, the order entry system was in gross disarray and production orders were disorganized. Key components for older Sun systems were not stacked on the storeroom shelves, and orders for those products still in strong demand went unfilled as new components were ordered, McNealy said.

Sun's orders for Sun-3 and Sun-4 workstations — as well as for the five products announced April 12 — have been stacking up. This resulted in customer shipment delays that lengthened from 30 days after receipt of order to as long as 60 days. "Most of our products are in the 45-day time frame now, and that is longer than we would like," McNealy said. He said he expects a return to 30-day shipments by July.

Other factors leading to the loss, McNealy said, were improper planning by engineering and other departments for the new product mix. Orders for older Sun products were stronger than forecast, and orders for the new products have lagged behind forecast. The exception is the Sparcstation 1, which is experiencing strong sales in Europe.

McNealy didn't rule out some reshuffling of Sun's corporate structure but stopped short of calling it a reorganization. "There is a very strong trend towards simplification and focus," he said. Even the order forms themselves will be simplified: "Simplification is something we embarked on six months ago, and it's a priority with me."

In hindsight, he added, Sun should have anticipated that it would hit a wall in terms of the HP system's capacity to cope with its work load. "People ask me what we could have done differently," McNealy said. "Three to four years ago, I would have made a decision to invest more heavily in information resource systems to plan this transition [to mainframes]. What happened was almost an unavoidable cost of growing into a $2 billion company."

Senior Writer James Daly contributed to this report.

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	Los Angeles	July 20*fm* August 15*m*
	Newport Beach	July 18*k* August 10*a*
	Ontario	July 27*f*
	Sacramento	July 19*k*
	San Diego	July 13*f*
	San Francisco	July 25 August 24
	Santa Clara	July 13*fm* August 17*fz*
	Universal City	July 6*f*
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IL	Chicago	July 19*fm* August 23*fk*
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IN	Ft. Wayne	July 12
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KS	Wichita	August 15
KY	Lexington	July 18
LA	Baton Rouge	August 24*m*
	New Orleans	July 27*f*
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	Burlington	July 12*a* August 17*a*
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COMPUTERWORLD

IBM's 3090 add-ons feed power-hungry users

BY JAMES DALY
CW STAFF

WHITE PLAINS, N.Y. — IBM upped the throughput speed limit on the most powerful models of its Enterprise System/3090 family last week with the introduction of a trio of products designed to provide more processing punch in numerically intensive applications.

The Supercomputing Systems Extensions essentially add lanes to the ES/3090's I/O highway, which has become a bottleneck on the road to supercomputing performance. The introductions included the following:

- A High-Speed Channel (HSC) capable of transferring data at up to 100M byte/sec.
- Clustered Fortran, which allows users who have outgrown tightly coupled parallel processing installations to connect multiple ES/3090 systems at the Fortran application level, executing jobs across as many as 12 processors.
- The Parallel I/O Access Method, which increases throughput by allowing users to read and write Fortran and assembler files in parallel across multiple direct-access storage devices.

"This proves conclusively that IBM is deadly serious about the scientific market," said Charles Casale, president of The Aberdeen Group, a Boston-based research firm. "Before this, the I/O was the real limiting factor in using the 3090 for any kind of numerically intensive computing."

Sates their appetites

The products drew immediate praise from power-hungry users. "We're very excited about having both the High-Speed Channel and Fortran cluster on the same machine," said David Caughey, acting director of Cornell University's Theory Center. "This is exactly what we need in order to be able to do interactive visualization at the same time as running parallel across the cluster."

The rollouts also mark an IBM commitment to major improvements in its supercomputer product line. An IBM spokesman said the claim that the Clustered Fortran can run on as many as 12 processors — high-end ES/3090s offer only six — indicates that the company "intends to increase the parallelism of its supercomputing environments." At Cornell University, for example, preliminary research is being done on coupling two six-processor 3090 Model 600Es.

Low-end computers from Cray Research, Inc. may also feel the heat. Although IBM will still be unable to match a Cray's computational speed, the add-ons clear up nagging limits that have long dogged IBM's vector facilities, which can provide near-supercomputer performance at a fraction of the price.

Reaching goals

The Supercomputing Systems Extensions also signal a gradual move toward the performance target area that researcher Steve Chen is shooting for. Chen is working on a supercomputer design for IBM that is indicated to have up to 64 processors.

"I don't think IBM believes the ultimate solution in making it in the supercomputer market is with attached vector processors, especially for the high end," said Patricia Laupheimer, vice-president of research at Shearson Lehman Hutton, Inc. in New York. "All these developments could easily be applied toward Steve Chen's project."

Add-on vendors moved quickly to line up behind the products. San Jose, Calif.-based Ultra Network Technologies, Inc. immediately announced that it will offer network processor connections for the HSC that will link the ES/3090s to the company's 1G bit/sec. Ultranet network.

Prices for the 3090 additions will be available in 60 days, IBM officials said, with delivery scheduled to begin no later than the fourth quarter.

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Ashton-Tate Fights SQL Bugs

Same Query Run Twice Can Result in Different Replies

Ashton-Tate last week acknowledged that the Structured Query Language (SQL) portion of dBASE IV can produce inconsistencies and inaccurate results.

The crux of the SQL problems lies with three anomalies that occur when data is structured in a specific way, according to Knox Richardson, a spokesman for the Torrance, Calif., firm. As a result, the same query run two different times can result in two different replies, for example, or a query can retrieve incomplete information from the database. (See Chart, Page 8.)

Ashton-Tate does not plan to issue a diskette to fix the problem; it is, however, offering workaround solutions to users through its support lines and bulletin board, and on CompuServe, Richardson said.

Though Ashton-Tate is characterizing dBASE IV's SQL problems as "minor" and confined to specific circumstances, database experts claim their impact is more serious.

"The SQL in dBASE IV is unstable, unreliable and unpredictable," said Richard Finkelstein, president of Performance Computing Inc., a database consulting firm in Chicago.

"I don't see how anyone can use it," he added. "They'd have to know the answer to the SQL query ahead of time."

Surprisingly, the majority of dBASE users were unfazed by dBASE IV's SQL glitches.

"The drawbacks in SQL are an

See DBASE Page 8

PC Week, January 9, 1989

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Most IS policies cover viruses

BY MICHAEL ALEXANDER
CW STAFF

Though your firm's insurance policy may not specifically mention computer viruses, there is a good chance that it will cover damages caused by an attack.

"The general conclusion of the insurance industry is that if a corporation's data or even hardware is destroyed or damaged by a virus, they will be covered," said John Lamberson, a software industry specialist at Corroon & Black Corp., an insurance brokerage firm, in a recent speech.

Damages caused by a virus fall under the heading of vandalism and malicious mischief, a provision that is common to even the most basic electronic information system insurance policies, Lamberson said.

The recent spate of news reports about viruses has alarmed insurance providers, but after careful reflection, "they have concluded that viruses do not pose an unacceptable risk," Lamberson noted. "Damage from a virus is not unlike the damage that would result from power failures or employee errors."

A handful of insurance companies offer or plan to offer policies specifically aimed at protecting computer users against virus attacks, but Lamberson said he doubts that it will become an industrywide practice.

"I think we'll see instead a heck of a lot more attention paid by insurance companies to the basic security procedures taken by the insured," Lamberson said.

Specs for X.400 link announced

BY ELISABETH HORWITT
CW STAFF

SANTA CLARA, Calif. — The X.400 Application Programming Interface Association expects to announce specifications June 20 that will allow different vendors' systems to use the same server to communicate with other X.400 systems.

That week, the Aerospace Industries Association Information Technology Committee will hold the first demonstration in which all eight service providers involved in its X.400 pilot will use the protocol to interconnect with each other and private electronic mail systems, said Steve York, the group's chairman and a manager at Hughes Aircraft Co. The demonstration will occur at the Electronic Mail Association's meeting in San Francisco.

The API group was founded by Retix Corp. and Telenet Communications Corp. last February in response to "rumblings from big users" who objected to having to implement "five message servers and five X.25 gateways on one LAN, just because vendors couldn't get all their applications to talk to one X.400 message center," said ATI co-chairman David Knight of Retix.

The gateway will "significantly reduce the complexity of tying together LAN mail systems," York said. "We have a bunch of LAN mail systems and would like to use fewer than one server per brand." The API group's release is "one more brick in the wall of the reality of X.400," he added.

The group's next project is to develop an API to allow any software application — not just E-mail systems — to access X.400 functions transparently, Knight said, "so you can sit at your Lotus spreadsheet, hit a key, pop up a menu with a directory and send it to another office or city."

The API group includes AT&T, British Telecom, Digital Equipment Corp., Dialcom, Inc., Lotus Development Corp., SoftSwitch, Inc., Sun Microsystems, Inc., 3Com Corp. and Novell, Inc. affiliate Indesys.

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COMPUTERWORLD

Reflex 2.0 frees DBMS space

BY JEAN S. BOZMAN
CW STAFF

SCOTTS VALLEY, Calif. — Borland International is replacing its 4-year-old Reflex flat-file database management system with an updated version, Reflex 2.0, executives from the software firm said last week.

The product, which removes current restrictions on database size by using a personal computer's hard-disk memory, was demonstrated at the Boston Computer Society meeting in Boston last week.

Borland's strategy is to enhance rather than abandon the widely installed Reflex, said Kenneth C. Einstein, director of Borland's applications strategy. He said several hundred thousand copies have been sold worldwide but did not give an exact number.

The new version is intended for use on PC-DOS-based IBM personal computers such as IBM Personal Computer XTs, ATs and Personal System/2s. Features supported in Reflex 2.0 include interactive cross-tabs, high-quality graphics, multiple views and hot-linked windows.

Borland plans to discontinue sales of the older Reflex version immediately and charge a $75 upgrade fee to current Reflex users. The firm will charge a one-time fee of $249 for a single Reflex 2.0 license, which is $100 more than the previous version's price tag. Users may, however, copy the Reflex code for personal use at home and the office, Einstein said.

Reflex 2.0 is faster than Reflex 1.1, Borland claimed, because of a revamping of its underlying records management structure. Reflex 1.1, introduced in 1986, had an upper limit of 30,000 records and required 340K bytes of memory under PC-DOS 2.0. Now, Reflex 2.0 uses 512K bytes of memory and a 20M-byte hard disk to support as many as 65,000 records in a single file. Users can now build DBMSs up to 32M bytes, Borland said.

Designed using object-oriented methods, Reflex 2.0 supports Borland's Virtual Real-time Object-Oriented Memory Manager (VROOM), a key component of other Borland products. VROOM lets PCs leverage the extra memory in the system's hard disk to achieve better performance through less frequent paging and I/O calls to disk.

Bush hints at tech sales to Eastern Bloc

BY NELL MARGOLIS
CW STAFF

WASHINGTON, D.C. — The door to U.S. computer industry exports to East Bloc nations, which slammed shut after the Soviet Union invaded Afghanistan in 1980, inched open last week when President Bush said the administration will consider making exceptions to the ban on a case-by-case basis.

Spokesmen from IBM and Digital Equipment Corp. were quick to caution that the president's proposal is likely to have a minimal effect on each firm's sales, at least in the short term.

"We do only a very modest business in the U.S.S.R.," an IBM spokesman said. Moreover, he said, the proposal, still in its infant stages, is likely to apply only to low-level technology.

James Gallatin, an international trade attorney at law firm Gaston & Snow, said high-end hardware and technology with strategic military potential will stay on the restricted list. However, he noted, that still leaves vast territory to be explored by U.S. computer manufacturers.

"Modems, printers, hard disk drives, LANs, WANs, Ethernet boards — very advanced? No. Very big? Yes," Gallatin said.

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CW6/5/89

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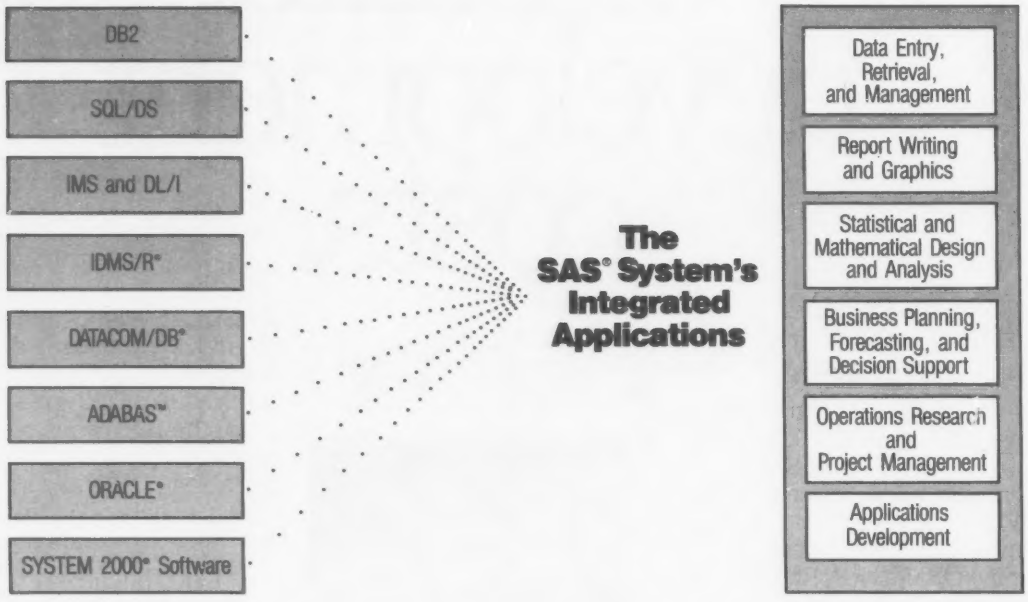

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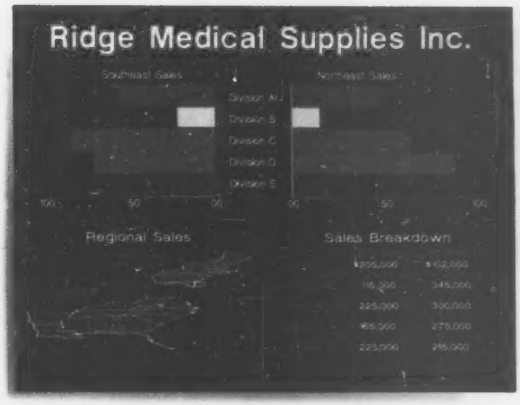
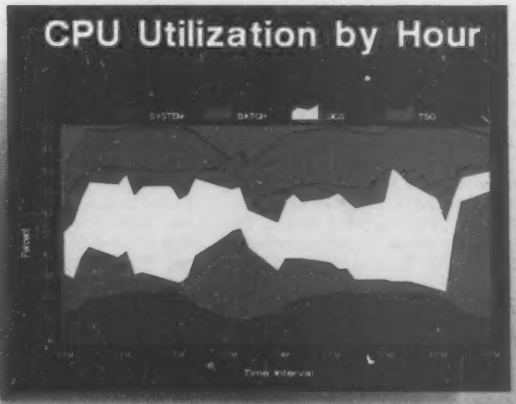
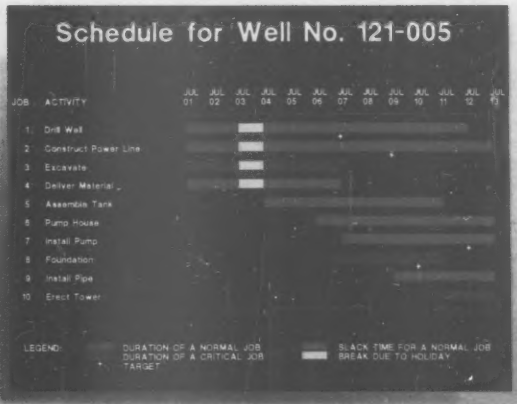






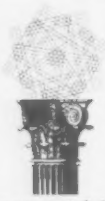
The SAS System runs on IBM and compatible mainframes; on Digital Equipment Corp., Prime Computer, Inc., and Data General Corp. minicomputers; on Sun Microsystems, Inc. and Hewlett-Packard workstations; and on IBM PCs and compatibles.

An educational smorgas-board

Chicago Board of Education draws IS managers' attention coast-to-coast

Editor's note: This is one in a series of profiles of nominees for the Computerworld Smithsonian Awards, *recognizing individuals and organizations that have achieved outstanding progress for society through the use of information technology. The awards will be presented in a ceremony held June 20 in New York.*

BY HELEN PIKE
CW STAFF



CHICAGO — The "company" has an annual operating budget of $2 billion.

With that money, it manages the second largest restaurant chain in Illinois after McDonald's, runs one of the state's biggest trucking fleets, does a brisk catalog sideline business and has one million on-line clients — all under the age of 21.

"If you drew up a Fortune 500 list, we'd be smack in the middle," said Clifford E. Cox.

But where computers and academic administration mean business, the Chicago Board of Education heads the list.

"We're in the business of developing students," said Cox, who left a consultant's post at Arthur Andersen & Co. eight years ago to become the assistant superintendent in charge of updating and managing the district's information systems needs vis-a-vis its students.

Davis, a onetime IBM systems engineer with a master's degree in business administration, and three high school teachers-turned-programmers have created a system that is reducing truancy, giving teachers more classroom time and boosting test scores for 425,000 students in kindergarten through 12th grade in a district composed of minority children from low-income families.

Not just any school system

"Vendors come in here all the time thinking we're just a school system they can sell a simple software package to. I tell them they have to think of us as a corporation," Cox said.

Cox has told that to the Board of Education as well, with dramatic results so far.

To date, the board has given him more than $25 million to create a modern on-line system from one that existed on mag cards; a system whose IS personnel now work on new applications instead of merely running outmoded programs; and a system that can instantly transmit a student's complete record from any one of 600 schools when it used to take as much as three months to transfer what was often an incomplete paper file.

Along the way, the country's third largest school system has drawn the attention of academia's IS managers from Los Angeles and New York — the nation's first and second largest school districts, respectively — and from as far away as Puerto Rico and Singapore. They come to look at the school's electronic attendance application, whose most talked-about feature is its autodialer, which calls the homes of students who are absent without a legitimate excuse.

TED KOSTON

Chicago educators *at the Help desk area*

The function is part of a one-two punch, supplementing teachers' calls to parents. It works from data that teachers enter during the day on the status of students who do not make it to class.

At one high school, 88% of the student body now shows up for classes, nearly a 2% improvement over last year.

They also come to examine an electronic report card application that, in one instance, allows a teacher with 125 students to key in her students' grades in about 20 minutes. Previously, teachers entered grades by hand, taking an entire day to do so — a day in which students did not have to attend class.

"This means I can teach a whole other chapter of math and sometimes more," explained high school teacher Ofelia Solano-Guevara.

Another example of the attention Cox's Comprehensive Student Information System is drawing in academic administration circles is an electronic student record system. When fully implemented, these electronic files will chart students' progress — their grades, attendance, special needs, medical history, transportation needs and awards — from when they enter kindergarten to when they graduate from high school.

Cox characterized the system as "for teachers, by teachers."

One teacher is former high school math and computer programming instructor Laura Spitzbarth, who switched careers to do what she had been teaching. It gave her a huge advantage in being able to design in a fourth-generation language, for example, a 12-computer system that handles scheduling for both teachers and students.

Modernizing the system was done out of sheer necessity because "we were all getting writer's cramp from doing the programs by hand. And we wanted to eliminate redundancy," she said, adding that high schools with more than 600 students need access to a computer for programming enrollment and scheduling.

For the record

In Cox's centrally designed system, student records are maintained on a Unisys Corp. 1100/94 mainframe while the district's finances are handled by an IBM 3033 mainframe. Data is downloaded to IBM Personal Computer compatibles at individual schools. The district operates a private digital network based on leased lines from Illinois Bell. Cox's annual budget is $17 million, with $12 million going to hardware operating costs and $5 million to personnel.

"After you've gathered years and years of data, you have a tool for the teachers to help develop the students," said Cox, who instituted monthly computerized reports to track the district's needs.

With up-to-date statistics at his fingertips, Cox continues to implement a vision for improving Chicago's public schools that is based on computer technology — a vision without which, Cox said, the future would not happen.

Bush: Japan hampering supercomputer sales

BY ELLIS BOOKER
CW STAFF

The Bush administration last week accused Japan of unfair trade practices, saying it uses structural obstacles to hamper U.S. supercomputer manufacturers from doing business in its country.

The citation, compiled under the so-called Super 301 provisions of the 1988 Trade Act, is the second major trading violation charge against Japan by the administration in as many months. It could result in trade sanctions against the U.S.' largest trading partner within a year if the dispute is not resolved through negotiations.

A spokesman for Minneapolis-based Cray Research, Inc. asserted last week that his company has had years of difficulty penetrating the Japanese market — particularly the government-controlled public sector.

Cray, which claims an 80% market share of the worldwide supercomputer market, said it has only a 15% market share in Japan, 23% of which is represented by sales to the commercial market. Conspicuously, however, the company said it has only a 3% share of the public sector.

Cray has complained to the Japanese for several years about such unfair procurement practices as late notification of requests for proposals (RFP). The company also complained that Japanese RFPs often contain a requirement for instruction-set — rather than functional — compatibility with existing, typically Japanese, computers.

This requirement, Cray said, effectively favored domestic Japanese computer makers in supercomputer bids.

However, neither Cray nor Control Data Corp., which folded its supercomputer operation in April, were among the 39 companies and industry associations that submitted public comments to the Office of the U.S. Trade Representative for its Super 301 list.

"If we find that the country is not willing to negotiate or make progress, then one option available to us is retaliate by raising tariffs or other fees on goods and services from that country," explained a U.S. trade official.

This retaliation, which is not currently planned, would likely start with high-technology goods but would not be limited to these products, she said.

The Bush administration also charged that Japan has a government policy explicitly protecting domestic satellite providers and maintains unfair tariffs against imported lumber. Brazil and India were the two other nations on the Super 301 list. But Japan, which last year had a $55.4 billion trade imbalance with the U.S., was the primary target of the White House, according to Washington sources.

On April 28, in a separate action, the U.S. Trade Representative charged Japan with violating the 1986 Market-Oriented, Sector Selective Agreement on Telecommunications, or MOSS Agreement, which calls on both countries to maintain fair and open access to each other's telecommunications markets.

'Quick, decisive action'

Testifying before the U.S. International Trade Commission's 301 Committee on May 24, Sematech Chief Executive Officer Robert N. Noyce applauded the government's move as showing a "willingness to take quick and decisive action in a situation epitomizing the Japanese strategy of targeting a critical industry."

But Noyce went on to warn that "well-deserved and well-intentioned" sanctions relating to telecommunications could have the unintended result of harming the U.S. semiconductor industry.

He said the suggested sanctions "will, in fact, harm the U.S. semiconductor industry by forcing American companies to pay tariff-inflated prices for certain semiconductor equipment."

Noyce referred to the lesson of sanctions on dynamic random-access memory computer chips, which were imposed by the U.S. after it was proved the Japanese had been dumping the chips, or selling them below production costs.

"The retaliatory action by the United States came after Japan had already achieved dominance," allowing the Japanese to use their monopoly power to "establish an export cartel at the expense of the U.S. semiconductor users," he said.

Noyce recommended an eight-point plan, including a graduated tariff beginning at 6% and increasing 2% per month until there is a balance of trade for telecommunications products between Japan and the U.S.

In addition, Noyce called for most of the collected tariffs to be used to aid the U.S. telecommunications industry and to support high-definition television research and development.

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EDITORIAL

Filling holes

WHILE IN EUROPE last week, President Bush spoke eloquently of the need to tear down the continent's walls and barbed wire separating East from West.

But it may not be the words of George Bush or Margaret Thatcher or Mikhail Gorbachev that have the most profound impact on rebridging the craters left behind by World War II. This role will largely fall to a force that is inherently apolitical: computer and communications technology.

Indeed, technology is the linchpin that will bind Europe into a single economic community beginning in January 1993 (see story page 1). The prudent deployment of computer and communications technology will determine just how competitive U.S. companies will be in what will shape up as a booming united Europe.

Already, several U.S. multinational firms are laying the groundwork both to exploit the opportunities of a united Europe and to protect against supercharged European companies laying similar plans.

There is also a golden opportunity (if not a mandate) for U.S. multinationals to unify their IS operations at home and abroad and then expand this unification to include all global operations.

As our story points out, there are no magic formulas or universal panaceas to prepare us for the European consolidation. But certainly there is no time like the present for prepping for tomorrow, especially when certain elements of the future are in such clear focus today.

Moving ahead

As a player in the information and communications business, AT&T has certainly taken its lumps, particularly since 1984's court-ordered divestiture. Despite its enormous resources, AT&T was widely seen as being light-years behind competitors that, unlike AT&T, did not grow up as regulated monopolies. It was said that the firm did not understand modern marketing, its work force was monopoly-bloated and its management was inextricably shackled to the old days and old ways.

Now it seems that "Telephone" (as AT&T was known in the olden days) is showing a different face. That face was really shining last month when AT&T and its largest union negotiated one of the most progressive labor agreements seen in some time. Provisions of the agreement strike right at the heart of the most pressing problems facing U.S. business today, including the impact of rapidly changing demographics and a shrinking labor force.

Specifically, the agreement provides for sweeping benefits for child and dependent care. Moreover, AT&T will voluntarily extend these benefits to non-union managerial employees.

In this case at least, AT&T is way ahead of the pack. The old dog has learned some new tricks. You have to wonder what else might be in store.

LETTERS TO THE EDITOR

Cry of the clone

Regarding your editorial "A puzzling game" [CW, April 17], I think that most of the editorial is right on. However, I don't think its conclusion was accurate. The key to the executive suite is probably more than a generation away because these CEOs are cloning the next generation. They may not be good at using information technology, but they're super at cloning.

In economically tough times like these, cloning thrives. There are always a few exceptions to point to but not enough to make a difference. Information technologists are not known for their courage. Nevertheless, keep crying in the wilderness.

Sigmund J. Bienkowski
Manager
AT&T Data Systems Group
Morristown, N.J.

Techies unite

"Help wanted — visionaries preferred" [CW, March 20] said the industry needs Wizards, Magicians and Witch Doctors. What we need first is to rid management of Charlatans, Soothsayers and Fortune-Tellers — those nontechnical managers who make technical decisions using crystal balls and tarot cards.

Next, we should get rid of all of those hackneyed, worn-out phrases and other put-downs used by nontechnical managers to dismiss the superior capabilities of the technologist.

"The way to the executive suite" [CW, May 8] lacks focus when it says technical people can't manage computer technology. I say the industry and the technologists have both come a long way. We're not talking about hard-working computer technicians sometimes disparagingly referred to as "techies" but the professional, business-oriented technologists of the 1980s and '90s.

I don't know of another profession that is not run by the professionals themselves. Let's get computer professionals managing their own profession so they can use their vast experience to make the informed decisions needed.

Jeannette Butterfield
Green Village, N.J.

The Fund explains

We are concerned about misinterpretations that can be drawn from "Title search service puts attorneys on-line" [CW, April 24].

The transformation of our business with information technology was always intended. We did not sneak into the information business; we recognized that providing title information to the attorney was critical to the underwriting business of The Fund and the attorney.

We have always monitored our revenue sources. It was interesting that you noted that for the first time in 1982, revenue for total information sales did exceed that of title insurance. These two sources of income are interdependent, and The Fund does not view them as separate.

Marketing and advertising has been a business tool since the inception of The Fund. There was no new management team that entered The Fund in 1982. Over the past five years, two or three individuals who joined The Fund happened to have banking backgrounds, but this had no bearing on the issue of marketing or management directions.

The Fund was started by attorneys for attorneys. The only reason for our existence is to service the attorney. They are "dependent on us" only as long as we serve them well.

Your article leaves an impression of naivete and management ineptitude, which is not the case. Confusing the background of a few individuals with a company management change is simply not called for.

Charles J. Kovaleski
President
Turner Coad
Senior Vice-President
Attorney's Title Insurance Fund, Inc.
Orlando, Fla.

Reslicing the pie

Your Trends article on minisupercomputers [CW, Feb. 13] contained a misleading pie chart.

The chart, attributed to International Data Corp., shows the minisuper market at $206.5 million for 1988 and shows FPS Computing with a 6.1% market share, implying $12.6 million in revenue. In fact, our calendar 1988 minisuper revenue was approximately $24.5 million, or 11.9% of the total show. The increase in FPS' percentage, of course, means that the numbers shown for our competitors are erroneously high.

Jeff Wilson
Public Relations Manager
FPS Computing
Beavertown, Ore.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Local IS groups: Boon or bore?

ROBERT HARGROVE

About once a month, like clockwork, I receive the well-appointed flyer or newsletter announcing the upcoming monthly meeting of my local information systems organization.

Whether aimed at trainers, personal computer enthusiasts, system managers or security specialists, these announcements have a way of seeking me out no matter how I try to avoid them.

Upon receiving these nagging missives, all the reasons for not going begin their old refrain:

- I haven't got the time. Because having the time would concede that I had nothing to do at that particular time, it's an admission that might negate my pleas for more resources because I am so overworked.
- I'm not a joiner. I like my computer and maybe two other people.
- I don't like blue meat or making conversation with people while trying to figure out the proper eating utensil or cutting through a roll that should have been retired as a paper weight months ago.
- They might make me do something like talk or serve on a panel or make a presentation. The last time I raised my hand at one of these meetings I ended up as recording secretary.
- I don't want to drive across town to find out that the presentation is just a modified sales pitch.
- The ambience of out-of-focus transparencies or on-line demos that are doomed to fail ("Gee, I don't know what happened. The phone lines must be down in Akron") is not my cup of tea.

Eventually, fighting my own inertia, I relent — only to discover that my experience is much less horrible than I thought it would be. It helps if you view these meetings not as monthly out-of-the-office junkets, but rather as working labs where, with a little digging, one can extract some real nuggets of information.

These meetings can provide an excellent opportunity to conduct a little real-life research about what's working and what's not. The experiences of your colleagues can prove invaluable, and, in an informal setting, chances are that the appraisals you receive will be much more open and easy to evaluate than the information you might receive at a vendor's lunch.

These networking efforts can give you not only a sense of the state of your own local job market (always a handy piece of information), but also a larger view of your profession and where it is going. Many times these meetings can function as one part information and one part group therapy, as common experiences and attitudes can prove that you are not alone. ("Your project took how long, at what cost? Yikes!")

Homework assignment

Also, if vendors are present, put them to work. One should be aware, of course, that vendors have the same objectivity as lobbyists, but like lobbyists, they can provide a great deal of information on almost any subject related to their area. This groundwork can act as one factor in your decision-making process.

You also might find individuals who are willing to tell you what didn't work in their environment. They may give you a true picture of the resources and training needed to support a particular product or maybe even a demonstration of a product that you're interested in.

Even if you should be roped into serving on a panel or, heaven forfend making a presentation, don't despair. These organizations are a safe place to fail and a good place to try out your

act before presenting it to your management.

The price is usually right, as most of these organizations charge just a nominal fee to cover expenses. This is money that can be thought of as training dollars, always a notoriously scarce resource.

If you already are an officer of one of these organizations and are struggling to increase membership participation, try giving your members something to take back with them from the meeting. It needn't be a door prize. Give them some bit of knowledge or information they can apply to their day-to-day existence, a security technique, or a little-known technical tip about a commonly used system.

Time is the most valuable asset that most of your members have, so let them take something valuable back to work with them — something for themselves and something to justify their attendance for their bosses.

If the potential membership is still hesitant, let them know that the Surgeon General's office has yet to find any harmful effects associated with blue meat.

Hargrove is security and contingency planner at the University of Texas Health Science Center at Houston.

Up and down trends in systems integration

EFREM G. MALLACH

A trend can be interesting. Two converging trends are more meaningful and yield more insight. Such a convergence will soon impact information system users.

The first trend is the growth of systems integration firms. While experts disagree on how many billions of dollars such firms will take in this year — primarily because they disagree on just who is a systems integrator — they agree that the total sum is big and is getting bigger.

The second, seemingly unrelated trend is the move toward downsizing. Local networks of PCs deal with many information systems issues at a lower cost than mainframes — and more effectively for their users.

The profit picture for vendors that depend on the mainframe market for business is far from rosy. While nobody predicts the total demise of mainframes in six months or even six years, the set of problems which they solve best is shrinking.

When we look at these two trends together, we notice something strange and surprising: systems integration firms, despite the handwriting on the wall, continue to concentrate overwhelmingly on mainframe applications.

Some reasons for this are obvious. Customers of big systems integration organizations tend to be big user organizations. The mainframe will survive longer in megafirms and government mega-agencies than anywhere else. If large systems integrators can meet their goals by developing mainframe systems for such users and, more dubiously, if they will be able to do so for the indefinite future, such a strategy may make sense.

Also, a key concern of large systems integrators, most of which are MVS Cobol shops, is, and should be, keeping up the billable hours of technical staff. If they can do this most easily by finding MVS Cobol systems that integrate, that is what they should look for.

A third reason for the mainframe focus is good old corporate inertia. General Motors Chairman Roger Smith personified this in 1987 when he declared that "the best $7,000 car for the American buyer is a 2-year-old Buick." Smith's attitude explains why GM lost 20% of the U.S. car market. Companies that share GM's attitude may be courting GM's fate.

> THE PROFIT picture for vendors that depend on the mainframe market for business is far from rosy.

Some systems integrators are reacting to this situation. For example, Arthur Andersen Consulting, the systems integration arm of Big Eight firm Arthur Andersen & Co., recently went to great lengths to teach its staff about expert systems. However, in its own phrase, the teaching was an inch deep. Years of mainframe focus made it financially impractical to give its staff of thousands more than this. Real artificial intelligence use relies on a central team with deeper knowledge.

If this was the best systems integrators could do for a new application area, imagine what it would take to get their local staffs to implement a 3Com network that integrates Macintosh Hypercard, Oracle with SQL and C under OS/2 with Presentation Manager, and a TCP/IP gateway to a Sequent Computer Systems multiprocessor.

Some systems integrators try to cope with obvious deficiencies via strategic alliances with specialists. Such matchups are fine in specialized areas. Nobody expects a major systems integrator to be an expert on factory floor automation. However, in dealing with a basic technology such as local-area networks, strategic alliances are not the answer. The alliance simply papers over a problem and lets a systems integrator provide some sort of solution. By making it unnecessary for a systems integration firm's staff to learn new technologies, it perpetuates its own mainframe culture and inhibits the staff from learning enough about the new technology to know a better solution. It also ties its customers to the vendor with which the alliance was made, even if competitors have better solutions.

Now put these trends and facts together. Systems integration is booming, users want micro-based solutions, and systems integrators aren't positioned to satisfy them. What happens?

Simply the following occurs: The next big success story is likely to be a systems integrator that starts fresh with a different focus. This firm will know that cost-effective solutions must take advantage of cost-effective hardware, have a strategy of seeking out users who want the competitive edge that such systems can provide and maintain a commitment to keeping its staff at the leading edge of technology.

The strategy will combine the traditional systems integrators' skills in project management and systems analysis with the communications/networking and system development skills that today's environment calls for. It will not pretend that mainframes don't exist — but it will usually see them as the database at the other end of that communications line.

For now, we can only wait.

Mallach is a faculty member at the University of Lowell in Massachusetts and a consultant to users and vendors.

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SOFT TALK

Stanley Gibson

Can you spell 'keyboard?'

I was just wondering: Now that we are computer-literate, why would we need iconic interfaces?

Seven or eight years ago, we needed them. That was when personal computers were new, and ordinary people needed help finding their way with them. Come to think of it, Apple's Macintosh came along at just about the right time for many people who were starting out with PCs. Now, however, it's much too late.

The work force has been trained, cajoled and forced into using computers. Many were trained at a considerable expense. But that money has been spent — it's water under the bridge.

To take a trained worker and give him an easy-to-use interface that costs twice as much as the one he had is a pointless exercise unless he is being given a radically new application to deal with — one to which his previous training is not transferable.

Though it seems clear that an easy-to-use interface — one with which a user needs familiarize himself only once — will

Continued on page 27

Pioneer Codd revamps model

ANALYSIS

BY AMY CORTESE
CW STAFF

Just when you thought software vendors were finally getting a handle on relational technology, a new model waits in the wings for an autumn debut.

Edgar F. Codd, the creator of the relational model of database management and chief scientist at The Relational Institute, has drafted Version 2 of the famous relational model that shaped database technology.

The new version, RMV2, brings into a single model ideas published by Codd in various papers since 1979. While it builds on the original model published in 1969, RMV2 includes refinements as well as new design principles that extend the capability of today's relational systems, according to Codd.

At a recent presentation to the Washington, D.C., chapter of the Association for Computing Machinery, Codd said the new model was necessary to provide an abstract standard and to reduce the risk of "implementors' blunders."

While the widely cited 12-rule acid test for relational compliance laid out by Codd [CW, Oct. 14, 1985] still holds, the RMV2 has been expanded to include 333 features considered important by Codd, up from a mere 50 features in the original model.

This is certain to cause database management systems vendors to groan because, according to Codd, none have fully implemented his original acid test in their products. He contends that even the DBMSs that come the closest — IBM's DB2 and Tandem Computer, Inc.'s Nonstop SQL — are only 50% compliant.

DBMS vendors that were contacted recently were not willing to venture an opinion on the new model until they were more familiar with it.

The new features, grouped into 18 classes, deal with a range of structural and semantic issues including extended data types, database administration and the systematic handling of missing information.

At the public presentation of RMV2, attendees took a keen, albeit academic, interest in the new model. "I don't think you'll ever see all 333 features, but some will start to be implemented," said Robert B. Shaine, an economic analyst at Mitre Corp.

Guy Roullier, a senior systems engineer at the Computer Task Group, concurred, noting, "The commercial world needs to get their work done, and that has to take precedence over theoretical purity."

But users who were at the presentation were excited about such capabilities as a recursive join operation. "Users will start hammering on vendors for features," predicted a consultant employed at a major relational

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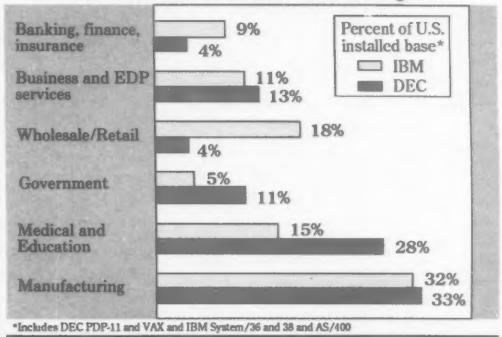
Inside

Data View

Splitting up the mini market

Their installed bases show IBM and DEC's strengths



*Includes DEC PDP-11 and VAX and IBM System/36 and 38 and AS/400

SOURCE: COMPUTER INTELLIGENCE

CW CHART: DOREEN DAHLE

Tandem wins bid for state vehicle database

BY J. A. SAVAGE
CW STAFF

SACRAMENTO, Calif. — The largest vehicle information organization in the world, the California Department of Motor Vehicles (DMV), will update its 20-year-old computer systems to employ a relational database engineered by Tandem Computers, Inc. Tandem won the $5 million development contract after a benchmark competition in which it beat IBM on hardware costs and transaction performance.

While Tandem's 28-processor VLX with Nonstop SQL beat IBM's 3090 Model 400S mainframe and DB/2 relational database in a $1 million benchmark test conducted by the state, Tandem's 70 transaction/sec. for the state's configuration was nowhere near the company's top claim in its own benchmark, which was 208 transaction/sec. The benchmark, however, was

Continued on page 29

A Comparison Chart of the Major Cooperative Processing Software Products:

Functions:	SUPER-LINK® Family	Enter/3270®	IBM's HLAPI™	IBM's APPC™ or CPI-C™	SQL*Star®	Arbiter®	Automator™
Cooperative Processing Topologies Supported							
Server/Requester	YES	NO	NO	NO	NO	NO	NO
PC-based Front-end To Existing Programs	YES	YES	YES	NO	NO	NO	YES
SAA/CUA Front-end Created Without Host Code Changes	YES	NO	YES	NO	NO	NO	NO
Peer-To-Peer Communications	YES	NO	NO	YES	NO	YES	NO
Distributed Database	NO	NO	NO	NO	YES	NO	NO
PC Developer's Toolkit							
4GL Language	YES	YES	NO	NO	YES	NO	NO
DBMS	YES	NO	NO	NO	YES	NO	NO
Screen Capture Facility	YES	YES	NO	NO	NO	NO	NO
Forms Generator / Screen Painter	YES	NO	NO	NO	YES	NO	NO
Can Call 3GL Subroutines	YES	YES	NO	NO	YES	NO	NO
Scripting Facility	YES	Partial	NO	NO	NO	NO	YES
Virtual Operator Mode	YES	YES	NO	NO	NO	NO	NO
Local Mainframe Communications Simulator	YES	NO	NO	NO	NO	NO	NO
Debugger	YES	NO	NO	NO	YES	NO	NO
Form Testing & Debugging System	YES	YES	NO	NO	YES	NO	NO
Host-based Transaction Simulator	YES	NO	NO	NO	NO	NO	NO
Automatic COPY LIB Generation	YES	NO	NO	NO	NO	NO	NO
Micro-based Table Generation Utility	YES	NO	NO	NO	YES	NO	NO
Automatic Generation of PC-level Documentation	YES	NO	NO	NO	NO	NO	NO
File Transfer Support							
ASCII/EBCDIC Conversion Of Data	YES	NO	NO	YES	NO	YES	NO
Transfer Of Binary Files & Text Files	YES	NO	NO	NO	NO	YES	NO
Transfer Under Host Or PC Program Control	YES	NO	NO	YES	NO	YES	NO
Full SDLC Error Detection/Correction For Asynch Links	YES	NO	NO	NO	NO	YES	NO
Front-End Processing Support							
SAA / CUA Fully Supported	YES	NO	NO	NO	NO	NO	NO
Optional Host Screen Pass Through	YES	YES	NO	NO	NO	NO	YES
Dynamic Control of Field Attributes	YES	YES	NO	NO	NO	NO	YES
PC FORMS of Up To Four Pages	YES	NO	NO	NO	NO	NO	NO
Field-level, Context-sensitive Help Facilities	YES	NO	NO	NO	NO	NO	NO
Automatically Non-Intrusive Help	YES	NO	NO	NO	NO	NO	NO
Optional Learning Mode Automatically Displays Help	YES	NO	NO	NO	NO	NO	NO
Icon-based Menus	YES	NO	NO	NO	NO	NO	NO
Light-bar Menu Selection	YES	YES	NO	NO	NO	NO	NO
Dynamic & Programmatic Cursor Control	YES	YES	NO	NO	NO	NO	NO
Softkey Labels	YES	NO	NO	NO	NO	NO	NO
Text Windows	YES	NO	NO	NO	NO	NO	NO
Peer-to-Peer Processing Support							
Data Compression	YES	NO	NO	NO	NO	YES	NO
Call-level interface between host and PC programs	YES	NO	NO	NO	NO	NO	NO
All Host Databases Supported	YES	NO	NO	YES	NO	YES	NO
All Host Applications Supported	YES	NO	NO	NO	NO	NO	NO
PC Developer's Toolkit Included	YES	NO	NO	NO	YES	NO	NO
Software Distribution Support							
Programmatic Interface	YES	NO	NO	NO	NO	NO	NO
Time/Date or Checksum Host Query	YES	NO	NO	NO	NO	NO	NO
Background Communications Support							
Simultaneous Background/Foreground Processing	YES	NO	NO	NO	NO	NO	NO
Control of Communications From Foreground Program	YES	NO	NO	NO	NO	NO	NO
Communications Protocols Supported							
LU2 Support	YES	YES	YES	NO	YES	YES	NO
LU6.2 Support	Planned	Planned	NO	YES	Planned	YES	NO
Application Portability							
Front-End Processing to Peer-To-Peer	YES	NO	NO	NO	NO	NO	NO
DOS To OS/2	Planned	Planned	Planned	NO	YES	Planned	Planned
LU2 To LU6.2	Planned	Planned	NO	NO	Planned	YES	NO
Host Environments Supported							
IBM TP Monitors Supported							
CICS	YES	NO	NO	YES	YES	YES	NO
IDMS/DC	YES	NO	NO	NO	NO	NO	NO
IBM Interactive Systems Supported							
VM/CMS	YES	NO	NO	NO	YES	NO	NO
MVS/TSO	YES	NO	NO	NO	YES	NO	NO
DEC VAX Supported	YES	NO	NO	NO	YES	NO	NO
Minimum PC Hardware Requirements							
IBM XT or Equivalent With 640k	YES	YES	YES	YES	NO	YES	YES

Every effort to present an accurate chart has been made, however no guarantee can be made. Enter/3270® is a registered trademark of Aspen Research. Automator ™ is a trademark of Direct Technology. Arbiter® is a registered trademark of Tangram Systems. SQL*Star® is a registered trademark of Oracle Corporation.

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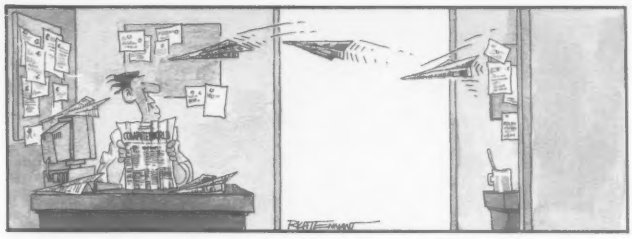

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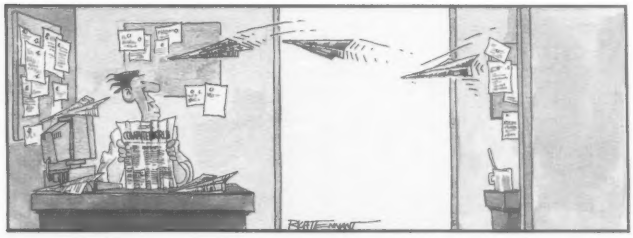

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Grist for the investment mill

ON SITE

BY JAMES DALY
CW STAFF

NEW YORK — For those of us who have trouble balancing a checkbook, consider George Reid's mind-rattling task. As director of MIS and management services at the Sanford C. Bernstein & Co. research and investment house, Reid oversees a computer setup that keeps tabs on the financial particulars of 5,000 customer accounts worth more than $13 billion.

To that end, Reid must use the sharpest technological blade available to carve through the financial data that arrives continually. His latest weapon is DEC's 4-month-old Vaxstation 3100 workstation.

"From a raw CPU power perspective, it's just what we're looking for," said Reid, who plans to equip all of the company's 180 portfolio managers with the machine.

The 25 Vaxstation 3100s installed so far were added to an environment that included networked Vaxstation 2000 workstations, a VAX 8530 cluster, several Microvax 3500s and 3600s and a handful of IBM Personal System/2s.

The entire setup greases the wheels in the company's portfolio management service, which performs the gentle art of handling someone's money as if it were its own. Historically, the task of money management had been consigned to the trust department of a nearby bank, but during the past 10 years, specialty firms have arisen that will play the market, buy bonds and invest cash for those who have neither the time nor the inclination to do it themselves.

Sophistication

At Sanford C. Bernstein, the 3100s are primarily in the hands of portfolio managers who rely on sophisticated computer models running on an IBM 4381 to chart a daily investment course that is tailored to each portfolio.

The model consolidates a litany of assorted financial information, couples that with the individual investor's preferences and then decides what should be bought and sold.

The new machines will be networked into this monetary lifeline to deliver trade indications to the traders' desk in a more rapid manner.

On a typical day, stock and bond market information is complete and ready to be entered into the 4381 in the wee hours of the morning. By 6 a.m., that information has been transferred into a VAX database environment running Sybase, Inc.'s Sybase. The 3100s continually tap into the database to see if it has been updated.

When the updating is complete, the 3100s begin their correlative gymnastics, pairing the updated financial picture with the foibles of each portfolio in an attempt to optimize the investor's financial picture. Assets are bought, sold or traded according to what the investor has previously requested and the market dictates.

Spring into action

By 7:30 a.m. each business day, the 3100s have updated all the portfolios, which will then spring into action when the bell on the New York Stock Exchange rings two hours later.

Still, it was not always this easy. "On some bad mornings, this may creep toward 9 or 9:30. Then, the stock market is

Continued on page 27

Unisys 2200/400 units check 'inn' at La Quinta

BY ROSEMARY HAMILTON
CW STAFF

SAN ANTONIO — Unisys Corp. may not have come through on time for La Quinta Motor Inns, Inc., but the organization and its new 2200/400 mainframe are now receiving high marks from this motel chain.

La Quinta, a longtime Unisys customer, was set to receive one of the first 2200/400s late last year when Unisys Corp. announced a one-quarter delay in shipping the new mainframes.

For La Quinta, the new shipment schedule put off a badly needed upgrade. But the company decided to hang in there with Unisys and not change plans because it was assured that the new schedule would still bring the mainframe in before La Quinta's busiest season — the summer months.

The 2200/400 replaced an 1100/70, which was no longer delivering enough processing power for the company's expanding reservation system, according to Sam Peace, director of operations.

As La Quinta's primary mainframe, the 2200/400 handles this in-house developed reservation system along with all of the nuts-and-bolts applications for the business.

Currently, it supports approximately 300 users, including the reservation system staff, while running an average of 18 batch jobs at any time, said Madison Pruet, a systems analyst.

The system arrived in March. After several weeks of testing the operating system release, La Quinta switched to production mode in late May.

"It's hard to criticize," Peace said. "It's been performing well, and the conversion was easy."

Peace said the most obvious change since switching over occurred with the reservation system, in which response times have been cut by one-third to one-half.

"From just this week, it's a definite improvement," Peace said.

It's always something

The one complaint Peace has, however, concerns the 2200/400's inability to partition operating enviroments. With the 1100/70, Peace can split the system in two, leaving one operating area for systems software testing and maintenance. According to Peace, it cannot be done with the 2200 and the latest operating system release.

As a result, Pruet squeezes time in at nonpeak moments. "We have a two-hour window at night, and we'll have to take longer to implement stuff because we'll have to bring down the systems at those times now," Pruet said.

But the breathing room the new system has brought to La Quinta's user community outweighs this inconvenience, Peace said.

"It has much more capacity, two and a half times greater than what we had," he said.

As for the 1100/70, Peace is not sure of its fate. He said he is considering keeping it as a backup system for the 2200/400 but will likely sell it.

In several weeks, La Quinta will enhance the reservation system with Hewlett-Packard Co. personal computers installed at the 200 La Quinta motels.

DG extends mini, cuts price

WESTBORO, Mass. — Data General Corp. breathed new life into its midrange line late last month with the introduction of less expensive models that it will offer as preconfigured systems.

The Eclipse MV/15000S series, made up of three models with different memory and storage configurations, was designed to lure new customers, according to John Morrell, product manager. It is positioned as an extension of the MV/15000 series, which DG will continue marketing primarily to its current customers.

DG cut the starting price of the S series to below $100,000, while the 15000 series will continue to sell above that mark. For example, a 15000S starts at $90,700, whereas a 15000 with the equivalent amount of main memory and storage would sell for $120,000.

Morrell said DG expects the 15000 to appeal to some existing customers who want to upgrade but do not want the disk and tape subsystems that currently come with the S series.

With the 15000S, the company reportedly hopes to win over some users who are looking at the IBM Application System/400 or Digital Equipment Corp. VAX 6300 as their midrange system.

The new models are available immediately, according to the company.

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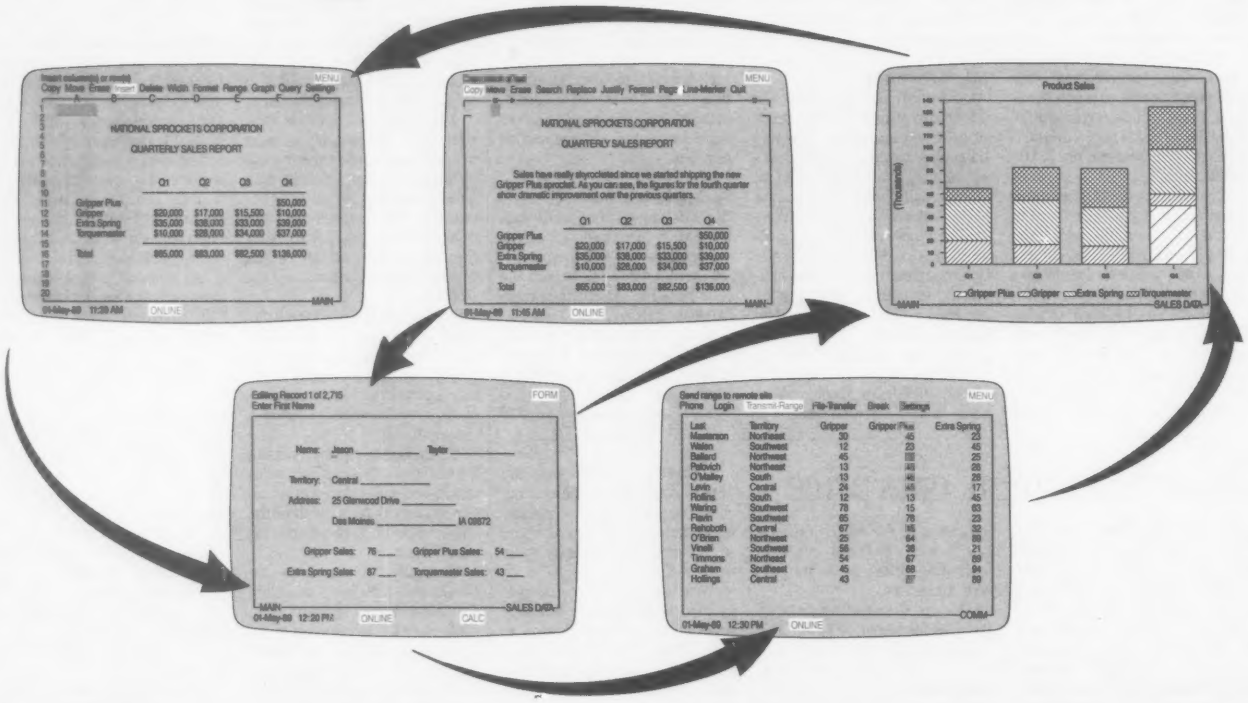

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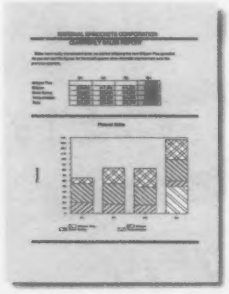

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Second, Symphony's macros and sophisticated command language let you develop custom, turnkey applications for your users. In less time than if you'd developed equivalent applications with a high-level programming language. That way, your users don't have to know how the program works, only how to perform the applications you've developed.

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Lotus Symphony now with Allways

Grist

FROM PAGE 25

open, and you've got a problem because the decision process becomes rushed," Reid said.

Often those bad mornings were the byproduct of the slower Vaxstation 2000s, which Reid is glad to see shuffle down the corporate ladder.

"The 3100s have broken a lot of the boundaries the Vaxstation 2000 had," Reid said. "The main memory is a lot better, the throughput is much greater, and we've gotten rid of the RD53 disk, which is terrible for performance purposes."

Those advantages moved to the fore recently when Hewlett-Packard Co. announced it was purchasing Apollo Computer, Inc. Sanford C. Bernstein portfolio managers immediately tendered their shares of Apollo, then had to figure out what to do with the sudden glut of cash. The information was entered into their computers, and the answers for all accounts were developed within 90 minutes.

"It's comforting that when there's an opportunity for action, you're less than two hours from a complete answer on a lot of portfolios," Reid said. "With the slower systems, we would have needed up to six hours."

Reid said the most difficult part of the integration so far was integrating the PS/2 Model 50s used by 35 research analysts into the DEC local-area network. "There is no nice, natural progression from that environment into the VAX environment," Reid said. "It's that damn Micro Channel. Only recently were interface boards made available that will run Ethernet. Up until then, it was a question of 'you can't get there from here.' "

Gibson

FROM PAGE 23

save training money over the long run. But, at this point, that training money is only going to be spent on new employees or new applications.

Is this to argue that old-fashioned character-based user interfaces are better? No, not generally, but there may be times when they are. For many users who have become accustomed to a certain kind of screen and instructions, moving to a user-friendly interface may be a luxury that can be postponed for a number of years.

Even so, the wholesale abandonment of character-based screens is not a good idea. Sometimes text is better. To put it another way: If pictograms were so good, why was the alphabet invented? If looking at a picture and pointing to it is all we need to do, then a 1-year-old child is equipped for life and does not need to learn how to read and write.

Of course, pictures have their place. Even dictionaries have illustrations for words where it would be extremely difficult to offer a verbal explanation. But character-based alphabets have brought civilization a long way.

There are going to be times when some up-front training is going to save time in the long run. Yes, you do have to take the trouble to learn which function keys to press, but once you know the right ones, you can hit several keys in the time it takes to move a mouse to one icon.

User companies ought not regard the iconic interface as a capital expense that translates immediately into happier, more productive workers.

Gibson is *Computerworld's* senior editor, software.

Oracle adds application generator to CASE line

BY STANLEY GIBSON
CW STAFF

Oracle Corp. last week introduced CASE Generator, a third component in its suite of computer-aided software engineering (CASE) tools.

Oracle said CASE Generator, which joins CASE Dictionary and CASE Designer, generates portable applications directly from design specifications. CASE Generator takes information from CASE Dictionary and translates it into applications using SQL Forms, which is an Oracle fourth-generation language (4GL) development tool.

Alex Mollen, Oracle's CASE product manager, said support for other 4GLs will be added in the future. He added that CASE Generator does not yet work with Oracle's SQL Report Writer but said that support will come later.

Currently in beta testing, CASE Generator will be available in MS-DOS, Digital Equipment Corp.'s VMS and Sun Microsystems, Inc.'s version of Unix by July 1989, Mollen said. Pricing, although not finalized, will be according to hardware platform and the number of users. He said a typical workstation price would be $5,000 to $8,000.

Mollen outlined Oracle's repository strategy by expressing continued support of CASE Dictionary, which fulfills repository, dictionary or encyclopedia functions. He said it is necessary to continue to support the dictionary to ensure that VAX and Unix markets are supported. However, he expressed support for the Information Resource Directory Standard.

Mollen said that Oracle will make sure that all components in IBM's repository will be offered in CASE Dictionary. However, some objects in Oracle's dictionary will not be in IBM's repository. IBM's repository, although much discussed, has yet to be formally announced.

Mollen also said Oracle's dictionary will mimic DEC's Common Data Dictionary (CDD) Plus.

SOFT NOTES

Aries, Data General sign joint marketing pact

Aries Technology, Inc. in Lowell, Mass., and **Data General Corp.** signed a joint marketing agreement under which DG's sales force will be supported by Aries technical personnel in sales to mechanical design engineers.

Aries makes Conceptstation computer-aided engineering software, which runs on DG's line of desktop systems based on Intel Corp.'s 80386 microprocessor.

Hewlett-Packard Co. and **Interleaf, Inc.** recently announced that Interleaf intends to port and resell its technical publishing software for HP workstations.

Interleaf said it will begin shipping its Technical Publishing Software for HP 9000 Series 300 workstations in the fall. At that time, Interleaf will become an HP value-added reseller, the company said.

Cognos, Inc. in Ottawa said it signed its first European reseller agreement with **Waterland International** in Amsterdam, a supplier of manufacturing software.

Waterland agreed to resell Quiz, Cognos' report generator, with Waterland's manufacturing software. Waterland also committed to developing future manufacturing applications using Cognos' Powerhouse application development environment, in which Quiz is a component.

Software 2000, Inc. in Hyannis, Mass., a developer of business management software for IBM's Application System/400 departmental system, said it signed a training agreement with **Coopers & Lybrand.**

The accounting firm's consultants will be trained and certified by Software 2000 on the vendor's applications software. When trained, the consultants can help clients using Software 2000's applications to plan their information systems, Software 2000 said.

Sybase, Inc. in Emeryville, Calif., and **Dataease International, Inc.** recently announced a joint marketing agreement that will enable customers to build Sybase SQL Server applications with Dataease database software products.

Under the agreement, Dataease will develop a new version of its Dataease database that incorporates SQL support. The new database is intended to transparently translate full Dataease functionality, including table creation and native language queries and subqueries into SQL before going to the Sybase SQL Server for processing.

NEW DEALS

Army signs on Active's DAP 610

Active Memory Technology, Inc. said it shipped one of its parallel computers, the DAP 610, to the U.S. Army engineers in Vicksburg, Miss. The system, which costs $360,000, will be used to process airborne scanner imagery for mine field detection.

Valley Bank of Nevada plans to buy two **Unisys Corp.** A series mainframes and the Unisys Global Financial System for $6.4 million.

Meanwhile, the Central Library Consortium in Lancaster, Ohio, signed up with Unisys for a library management system. The system, which will be based on a Unisys 2200/201 mainframe and on 80 Unisys Personal Workstations, will run the Unisys circulation, on-line catalog acquisition and interlibrary loan software systems.

Qantas Airways Ltd. in Sydney, Australia, purchased a $400,000 documentation management system from **Context,** a division of Mentor Graphics Co. The system, which consists of six Context workstations, will be used to produce policy and procedure manuals.

Convex Computer Corp. recently installed a mini-supercomputer at the Institute of High Energy Physics at the Virginia Polytechnic Institute and State University in Blacksburg, Va.

FPS Computing recently shipped three Unix-based systems for computational chemistry applications. The new users are the University of Pittsburgh, the University of California at Los Angeles and the California Institute of Technology in Pasadena, Calif.

The Society for Savings in Hartford, Conn., signed a $1.4 million deal with **NCR Corp.** to purchase automated teller machines.

Tandem

FROM PAGE 23

constructed to address the department's special needs, including constant uptime, at least 30 complex transaction/sec. and a database with 12 tables in sizes ranging from one million to more than 80 million rows each.

In Tandem's original debit/credit benchmark, each transaction required five different types of SQL statements. In the California DMV benchmark, it required an average of 11.3 SQL statements, according to Praful Shah, Tandem marketing manager. Additionally, the database in the original benchmark had 3G bytes of information, and the DMV required close to 80G bytes, he said. IBM officials were unavailable for comment.

IBM passed two of seven performance tests; Tandem passed six. "IBM was unable to demonstrate acceptable performance levels needed to meet DMV's processing requirements," according to the department's benchmark report.

IBM bid hardware costs for the development system at $23 million. Tandem's cost was $10 million.

While IBM was found to "be superior" in the number of third-party tools available for the DB2 environment and was judged better in training because DMV employees were already trained on IBM terminals, editors and utilities, Tandem "demonstrated a higher degree of performance, availability and operational ease of use," according to the benchmark.

"We have 50 million records," said Del Pierce, director of the department. The current hardware platform, a Sperry Univac, was customized by RCA Corp., he said: "It runs in a straight line."

> IBM BID hardware costs for the development system at $23 million. Tandem's cost was $10 million.

However, when the old system was designed, "we never contemplated having to keep track of parking citations, moving violations and pollution control permits," Pierce said. For instance, Pierce said he never thought he would get a request for "every 1972 Pinto with the last two letters XY on the plates."

The department can do all those things "with a lot of time and lot of expense," said Don Leachman, chief of the department's division of data processing. Such information requests must be processed through the two sequential databases currently at the department, one for vehicles and one for drivers. Many times, the two do not match up, according to Leachman.

The relational database project dovetails with another breakthrough in driver's license technology. By early next year, California drivers should be receiving credit card-like licenses with a digitized signature and photo and a magnetic strip on the back with address, birth date and expiration information. No vendor has yet been selected to complete the license project, but Pierce said that the data will remain on the hardware and will be accessed by the new registration database.

It is estimated that the final database project will cost about $10 million. It will serve 10,000 terminals in the headquarters and 170 field offices, according to Leachman. Applications such as personnel management will reside on the host computer. Applications such as calendaring will be offered locally on the Apple Computer, Inc. Macintosh.

Codd

FROM PAGE 23

DBMS firm.

Among the significant enhancements in the new model is the notion of updating a view. With today's relational products, only views derived from a single relation, or table, may be updated. Codd contends that this is an unnecessary constraint. In the new model, he proposes the ability to update views derived from a join, or more than one table. Further, he maintains that the DBMS — not the user — should determine whether a view can be updated at definition time.

Codd devotes a good deal of attention to distributed database management, including how data should be carved up, and to maintaining flexibility to allow redistribution of data at a future point. He states that in a distributed database, a single relational command can operate on data located at two or more sites as if it were local, and each database should have local autonomy so that if it is cut off from communications, it can still operate as a DBMS. Codd foresees the need for a global database administrator who knows the content of every database in an organization.

Additionally, Codd expands on integrity, particularly user-defined integrity constraints and the features required for a relational language to support these types of constraints.

Looking ahead, Codd said that future versions of the relational model will be introduced in 10-year intervals, giving vendors time to sort things out.

Version 3, he disclosed, will expand the use of integrity constraints, so that in addition to preventing something from happening, they could be used in a more general way to trigger an action. For example, an accounting system could automatically generate a bill after a certain period of time.

> CODD foresees the need for a global database administrator who understands the content of every database in an organization.

"This is how businesses will incorporate a good part of business activity in the database world. The database will be a very central thought source," Codd said.

OS/2 NEWS

Volume 1, No. 4.

A continuing report on advanced software for personal computers.

New relational data base system helps PC users handle large volumes of data.

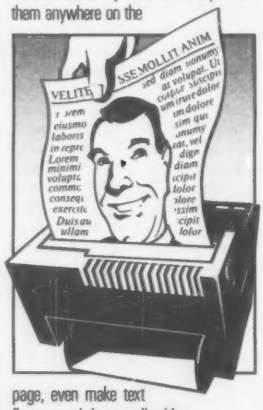
R:BASE® is an easy-to-use OS/2™ relational data base management system that features both menu and command-line interfaces. And because it includes LAN support for up to three simultaneous users (using the multitasking and networking support enhancements of OS/2), it's cost-effective as well. R:BASE also provides programming language support, and over 70 business and scientific functions are already integrated into the program. For more information on how R:BASE can help you manage large volumes of data call MICRORIM at 1 800 624-0810.

PC Paintbrush now available for Presentation Manager.

The OS/2 version of PC Paintbrush® uses Presentation Manager™ to make creative expression fun, fast and easy. PC Paintbrush for OS/2 is a graphics creation package that includes all the features of the DOS-based version. It lets you create intricate freehand graphics using the various brushes, lines, curves, colors and patterns. You can also use scores of drawing and text tools to create presentation-quality documents. For more information call ZSoft at 1 404 428-0008.

Word processing that goes beyond just words is introduced for OS/2.

IBM has released DisplayWrite 5/2 Composer.™ This advanced word processing software lets you scan photos and line art into your document, position them anywhere on the



page, even make text flow around them...all without cutting or pasting. DisplayWrite 5/2 Composer capitalizes on the protected mode and multitasking capabilities of the IBM OS/2 environment so you can run it as a foreground or background operation. See your IBM Authorized Dealer or IBM marketing representative for complete information.

Sophisticated reminder system helps you automate your processing tasks.

Enyart Development Corporation has started distributing Tickler/2.™ This advanced automated reminder system lets the user create a series of reminders to occur before, during and/or after an event. Tickler/2 can even remind your computer when to perform certain tasks. Because it can be used in conjunction with your data base, spreadsheet, E-mail and project management software, it gives you amazing versatility. For example, you could set up Tickler/2 to take a previously generated sales forecast spreadsheet, update it daily, print a report and electronically mail it to another computer at the end of every week...all while you're on vacation. For more information on the advanced capabilities of Tickler/2 call 1 303 286-8686.

Symantec's Q&A provides powerful file management for OS/2.

Q&A™ is an integrated flat-file data base and word processor that offers OS/2 users a unique combination of power and simplicity. With Q&A you can take advantage of OS/2 benefits like multitasking and large memory. Q&A OS/2 also offers the ability to share data bases on a network with the DOS version of Q&A. Multifile lookup in Q&A means you can merge data from multiple Q&A data bases into customer-designed forms and reports.

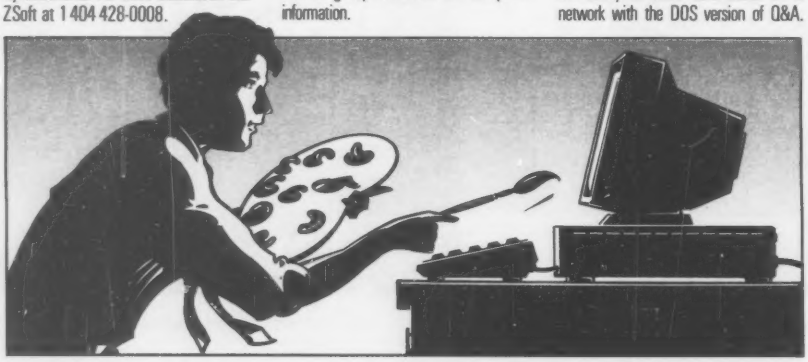
Q&A's executive word processor lets you create presentation-quality documents and easily perform mail merge with your data. For more information on how Q&A can solve your data base and word processing needs call 1 408 253-9600.

OS/2-based Platinum provides true multitasking accounting packages.

The Platinum® Series of fifteen accounting modules from Advanced Business Microsystems is a business accounting tool so powerful that on a single computer you can print and post several hundred invoices and checks, run a reconciliation, generate consolidated financial statements—and enter new budget figures at the same time. Platinum also makes it easy for you to integrate your accounting data with data bases, spreadsheets, presentation graphics, word processing, desktop publishing and other applications. For more information on Platinum call 1 800 999-1809.

Free OS/2 Application Guide available.

You can receive a 340-page OS/2 Application Guide that lists and describes over 800 identified applications for the OS/2 operating system. For a free copy of this guide call 1 800 IBM-2468, ext. 120.



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NEW PRODUCTS — HARDWARE

Data storage

Force Computers, Inc. has introduced a combination hard-disk and floppy-disk subsystem said to plug directly into standard Motorola, Inc. VMEbus backplanes.

The Mass Storage Module (MSM) incorporates industry-standard drives to provide up to either 42M or 84M bytes of formatted Winchester capacity and 720K bytes of formatted floppy capacity, the vendor said. The MSM-42 is priced at $1,990, and the MSM-84 costs $2,490.

Force Computers
3165 Winchester Blvd.
Campbell, Calif. 95008
408-370-6300

Sigma Information Systems has announced a controller designed to interface as many as seven small computer systems interface (SCSI) drives to a Digital Equipment Corp. Microvax II, Microvax 3000 or LSI-11 Q-bus system.

Designated the SDC-RQD11-SCSI, the product reportedly interfaces SCSI disk drives of any size and data rate to all standard DEC operating systems without modification.

Functions include seek optimization and overlap seek, as well as a connector that interfaces drive functions to a front panel. The device costs $1,425; quantity discounts are available.

Sigma
3401 E. La Palma Ave.
Anaheim, Calif. 92806
714-630-6553

Processors

A multiuser, Unix-based computer, capable of serving 132 device ports, has been introduced by Point 4 Data Corp.

Dubbed the Mark 2000, the system uses reduced instruction set computing technology and a 64K-byte cache for instructions. Memory is reportedly expandable in 8M-byte increments to 48M bytes.

Packaged in a tower-style cabinet, the basic system includes a 14 million instructions per second CPU, 8M bytes of memory, a 376M-byte small computer systems interface disk drive and an Ethernet controller.

Pricing starts at $54,500, with shipments scheduled to begin this month.

Point 4
15442 Del Amo Ave.
Tustin, Calif. 92680
714-259-0777

Mark 2000 *supports up to 132 device ports*

A fault-tolerant Unix-based workstation has been introduced by Concept Data Resources.

Hyperstation runs on AT&T Unix System V, Release 3. A standard configuration supports 32 users and incorporates 32M bytes.

It is priced from $30,000.

Concept Data Resources
8 W. 38th St.
New York, N.Y. 10018
212-302-7663

NEW PRODUCTS — SOFTWARE

System software

On-Line Software International, Inc. has announced an enhanced version of its system repair and diagnostic tool for IBM CICS.

Stabilize 3.0 is a menu-driven program that automatically detects and repairs storage violations, system abends and loop/wait conditions. The product reportedly offers improved control to operators who may not be familiar with CICS system programming and includes English text descriptions and report-generation capabilities.

The software is available for IBM MVS, MVS/XA and DOS/VSE, and pricing ranges from $19,000 to $44,000 for a permanent license, depending on the operating system.

On-Line Software
Fort Lee Executive Park
2 Executive Drive
Fort Lee, N.J. 07024
800-526-0272

Applications packages

Interactive Software Services, Inc. has announced that its financial management software system is now available to run on IBM Application System/400 and System/38 platforms.

According to the vendor, the Insight/Financial Management System incorporates several accounting modules, including general ledger, accounts payable, accounts receivable and purchasing. The complete system is priced at $45,000, and pricing for individual modules ranges from $10,000 to $16,000.

Interactive Software
Suite 306
4824 N. Scott St.
Schiller Park, Ill. 60176
800-288-8550

Financial management software for Digital Equipment Corp. VAXs was announced by Piedmont Systems, Inc.

PSI-Financials Applications Software includes modules for accounts payable, accounts receivable as well as general ledger and reporting. Pricing ranges from $22,500 to $33,500.

Piedmont Systems
P.O. Box 606
Middleton, Mass. 01949
508-774-4223

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3M

MICRO BITS

Douglas Barney

One lump or two?

Someone's got to lose. Television sports programs always show prefight interviews with boxers. This way, we can see what they look like before the lumps rise. It's always the same story. The fighter being interviewed boasts that he is going to win, even if he happens to be taking on a more youthful Marvelous Marvin Hagler or Mike Tyson and is in for a beating.

The battle for cooperative processing business will be like a championship boxing match. Someone's got to lose.

With cooperative processing, a lot of stuff runs on the personal computer, and a lot of stuff runs on some kind of a host. IBM loves it because it can sell both ends of the pipe. On the PC side, it'll sell you an Intel 80386-based system with 8M to 12M bytes of random-access memory. Of course, that is not nearly enough power. You'll also need a PC server, an Application System/400 or 370 mainframe to get the job done.

Mainframe software houses, some of which have been deteriorating rapidly, also love it because it gives users reasons to

Continued on page 38

Letting your PC do the walking

US West compresses its far-flung telephone directories onto CD-ROMs

BY DOUGLAS BARNEY
CW STAFF

DENVER — Most of us either thumb through a book or swallow our pride and call directory assistance to get a telephone number.

US West has a better idea: Let your computer do the walking. In this case, your personal computer had best have a compact disk/read-only memory (CD-ROM) player, because you are going to get enough phone numbers to hog 600M bytes of disk space if conventionally stored.

Instead of asking people to upgrade their hard disks or make room for 600 floppies, US West took this information, compressed it and slapped it onto a 5-in. CD-ROM disk. These disks are just like the ones holding Frank Sinatra's music.

The system, called US West Locator Plus, is a series of disks updated every month. The US West offering is typical of what several telephone companies are doing with directories. The system has more than 12 million names, with private residences and businesses that cover most of the western U.S. Users must acquire their own computer system and CD-ROM drives.

Locator Plus customers are not your typical phone callers. People who pick up this $5,000- to $13,000-a-year system are heavy directory assistance users such as credit firms that endlessly match phone numbers with names on credit card slips.

There is a surprising array of companies that use the system, said Bill Farrell, new product development manager at US West. High school reunion organizers, magazine fulfillment houses, banks, retailers and police departments are all using the system.

Not a lone wolf

US West did not do this alone. The firm contracted with Dataware Technologies, Inc. in Cambridge, Mass., which provides data access software and algorithms to compress and index the data. With the Dataware software, users can search 12 million records and get a response in less than a second.

The interface is simple, with few pop-up or moving windows, Farrell said. Despite the clean look, the system can perform some pretty sophisticated queries. Users can, for instance, ask for all the Smiths who live in a particular area code or who also have the first name John.

This is not US West's first crack at easing directory assistance hassles. An earlier dial-up system was squashed by the U.S. Department of Justice because it violated the consent decree that determines which services spinoffs from AT&T can provide. So instead of bringing the customers to the database, US West brought the database to the customers. This approach is approved by the Justice Department, Farrell said.

Another group within US West continues to work on a system that will put the Yellow Pages on optical disks.

IS meets the mavericks of desktop publishing

BY ELLIS BOOKER
CW STAFF

CHICAGO — Desktop publishers can be found sprinkled throughout the departments of many large corporations. They are the ones putting out those eye-catching publications, presentations and marketing materials that have helped add panache to the look of corporate America during the past couple of years.

But like the personal computers on which these publishing programs run, desktop publishing entered the corporate world in a haphazard fashion, which presents a worrisome issue for information systems executives looking at long-term issues of standards and companywide computer integration.

The recent Corporate Electronic Publishing Systems (CEPS) '89 conference here tried to address these issues, offering a program track targeted at executives and devoted to the relationship of IS to desktop publishing.

"Corporate electronic publishing is happening at a number of levels in corporations, and the most apparent is at the desktop," said Evelyn Selzer Wilk, president of ESW, a Chicago-based office technology consulting firm.

"Because it came in first on the Macintosh, MIS didn't pay attention," Wilk said. "Now, they turn around and say, 'My God, there are 50 Macs out there,' and they realize they must support these applications and grasp their functions."

This scenario is the rule, Wilk said, although some in IS are thinking ahead toward integrating desktop applications with companywide functions.

"I see a weak interest in integration, but interest in electronic publishing is at an all-time high," said Michael Waitsman, chief executive officer of Synthesis Concepts, Inc.

Most companies, he said, are willing to let desktop publishing — Waitsman prefers the term "corporate electronic publish-

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Inside

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SMALL TALK

Michael Alexander

Another look at end-user computing

Every full moon, a lot of market researchers like to gather around a bubbling cauldron of survey data and make predictions about the imminent demise of the information or data center. Most often they talk about how end users are getting smarter and how they will take over some of the traditional duties of information services professionals.

I came across yet another study on end-user computing recently, but this one has a refreshing twist — mainly because it does not foresee that end-user computing will bring toil and trouble for IS. In fact, this report concludes that end-user computing eventually pays dividends to the IS department. According to The Diebold Group, a management consulting firm in New York, end-user computing is expanding rather than curtailing the scope of the information services function.

With so many flavors of end-user computing, it is probably inevitable that IS would have to broaden its support capabilities rather than decrease them, according to Chester Frankfeldt, a senior associate at Diebold. Frankfeldt coordinated an evaluation of key technologies for Diebold and from that study was able to spot several end-user computing trends.

IS is supporting an increasingly diverse group of end users, ranging from those who use stand-alone PCs to those who

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3-D graphics serve many uses

ANALYSIS

BY MICHAEL ALEXANDER
CW STAFF

Three-dimensional computer graphics systems, long considered the special-purpose design tools of engineers, are increasingly being used by manufacturers for their nontechnical, competitive benefits. That is the main conclusion of a recently published study conducted by researchers at KPMG Peat Marwick & Co. on behalf of Silicon Graphics, Inc.

KPMG Peat Marwick's consultants visited five manufacturers in the U.S. and abroad to study how 3-D computing was being used in the industry. The team found that such manufacturers as Chrysler Motors Corp. in Detroit and Douglas Aircraft Co. in Long Beach, Calif., were using 3-D computing systems to reduce development costs, increase productivity, improve product quality, deliver new products to market faster, inspire innovation and reap other benefits.

The study noted that most manufacturers using 3-D computing were able to reduce the length of time on a project by at least 20% to 30%. Time savings resulted in a faster market introduction because 3-D computing eliminated much of the design reviews, tests and engineering change orders that the new products typically require, the consultants said.

3-D computing also contributes to better product quality because of enhanced design work, automated model building and graphics simulation of manufacturing techniques, the consultants found.

Karsten Manufacturing Corp. in Phoenix, one of the five companies that was studied for the report, uses 3-D computing systems to improve the design and manufacture of its highly regarded Ping golf clubs, according to Derick Balsiger, a design engineer at Karsten.

"We didn't go to this system for speed or turnover on design but to get higher accuracy and better design," Balsiger said. "Now, we're getting computer models to see if we like the product and to use physical properties such as weight and inertia to evaluate the design."

The company also improved the quality of its golf irons because 3-D computing allowed the designers to develop clubs that required less time to hand-grind the edges on an iron after it had been cast. Previously, hand-grinding operations removed the excess "flash" on an iron's parting line and tended to take off some of the iron's precision. Now, the irons are hand-ground in less time and are more accurate, Balsiger said.

KPMG Peat Marwick's management consultants also noted that companies using 3-D computing were better equipped to meet the diverse needs of their clients, whether inside or outside of the organizations. The team said that engineers at the National Aeronautics and Space Administration's Ames Research Center in Mountain View, Calif., for example, were able to download extensive amounts of data run on Cray Research, Inc. supercomputers into a 3-D workstation in which the information could be assimilated and presented in ways that nontechnical users could understand.

FTD picks multifaceted PC bouquet

ON SITE

BY RICHARD PASTORE
CW STAFF

DOWNERS GROVE, Ill. — Flower power will take on a new meaning in the 1990s. That is when FTD florists will begin flexing the muscle of Mercury 3000, a powerful multiuser, multitasking, personal computer-based system.

Mercury 3000 will permit Florists' Transworld Delivery Association (FTD) members to simultaneously run off-the-shelf business applications such as spreadsheets, access a membership directory service and transmit and receive retail orders, said Robert Poirier, director of operations at FTD subsidiary Floral Network, Inc.

Now in beta testing, the system consists of Unisys Corp. PW2 Model 850 PCs running Digital Research, Inc.'s Concurrent DOS 386 operating system. The 16M-byte Intel Corp. 80386-based PCs will be located in the florist shops and linked by dial-up 800 service to a Unisys 1100/74 mainframe here.

"We selected this system because we felt it provided the flexibility, growth opportunity and power that we wanted to put in the hands of our florists," Poirier said. Being able to run individually chosen business applications with retail applications lets the florist customize the system to meet his own business needs.

The technology selection process consumed nearly a year's time. "We probably looked at 20 to 25 vendors all across the country before we decided" on the Unisys PCs, Poirier said. "What it came down to was that Unisys was providing a quality product with a well-known name, and it was the right technology at the right price." Floral Network already owned the Unisys host.

The Digital Research operating system won out over four or five competitors because "our technical people felt that Concurrent DOS would be our best and most flexible choice for the future," Poirier said.

FTD will use *Mercury 3000 to speed up floral arrangement deliveries*

Mercury 3000 is a new-generation system for Floral Network. Mercury 2000, which the new technology will replace, was a mixed bouquet assembled from different vendors, including Zentec Corp. and Televideo Systems, Inc. "There was a dumb terminal with a processing board, no disk and limited memory," Poirier said. Multitasking was not possible. "Mercury 3000 is our first real [implementation] of an intelligent system."

Of the 24,000-plus FTD florist shops, 14,000 now use Mercury 2000. Poirier said he expects from 500 to 2,000 of them to opt for the 3000 in the next two years. Then, beginning in October 1991, Floral Network plans a complete replacement of the Mercury 2000 system with the new technology.

Once in gear, the changeover will be speedy, according to Poirier. "We put the 2000 out at a rate of 500 a month, and we expect to follow a similar pattern with the 3000."

Putting your money where your mouse is

BY RICHARD PASTORE
CW STAFF

Several years ago, only a mad scientist would have thought of crossing a mouse with a keyboard. But today, this bizarre hybrid has come to life as a versatile peripheral for IBM Personal Computers and compatibles.

The Powermouse from Prohance Technologies, Inc. in Sunnyvale, Calif., sports a 40-key built-in key pad. Each user-definable key can incorporate up to six different functions built from a virtually unlimited number of keystroke steps, according to Nancy Hartsoch, the company's director of marketing.

For example, a copying-and-moving function of Lotus Development Corp.'s 1-2-3 that traditionally requires 52 keystrokes to perform can be knocked off with four clicks of the Powermouse, Hartsoch said.

With such keystroke consolidation, "Productivity speeds can be anywhere from three to 10 times faster, depending on complexity," Hartsoch said. "The more complex the task, the more productivity you gain."

Reducing the need to move from mouse to keyboard frees users to concentrate more on the task at hand and less on the hand itself. "I've run whole sessions where I haven't taken my hand off the mouse to use the keyboard," said John Couleur, a Los Gatos, Calif.-based computer consultant and Powermouse user.

Users can also cut down on their mouse mileage by executing many commands and picking up tools without having to first move the mouse to the edge of the screen. Couleur, who uses the unit with Autodesk, Inc.'s Autocad on an IBM PC AT, said mouse movement had been reduced by at least 80%.

The mouse's keys come preprogrammed for common spreadsheet functions such as opening a window, editing data, copying a range and moving a column. Users can redefine the keys for use with other applications by editing, deleting or adding to the disk-based key definition tables. Couleur said he had no trouble reprogramming his unit for use with Autocad.

The Powermouse can be used with the IBM PC, XT, AT, Personal System/2 and true compatibles running DOS 2.0 or higher. It plugs into an RS-232 serial port and consumes 20K bytes of random-access memory. The product costs $199.

The company plans to introduce predefined key tables for computer-aided design and desktop publishing applications, as well as a "baby mouse" with fewer keys for users requiring less functionality, Hartsoch said.

Barney

CONTINUED FROM PAGE 35

buy old software. They just can't develop interfaces worth a darn. Most PC vendors dread the thought of dealing with mainframes, minicomputers or any other systems that demand such things as data integrity, security or the ability to handle more than one request at a time. But they do develop software that people can stand to look at. These are the two camps that will enter the ring.

In an interesting exercise to test the predictability of their responses, I called more than 10 companies, both PC- and host-oriented, and asked which has the advantage in cooperative processing. Similar to their boxing brethren, each side is ready to claim victory.

Mainframe vendors say the tough job is the host side. These things are not just expensive; they are complicated, too. PC vendors say having a large installed base is critical. The only thing left to do is to connect effectively to back-end computers running mysterious chunks of code with such names as VM, MVS, CICS, TSO, OS/400, DB2, SQL/DS and other colorless acronyms. Little cooperative software has actually shipped, so all users can do is wait with beta breath to test the products and deflate these overconfident vendors.

> LITTLE cooperative software has actually shipped, so all users can do is wait with beta breath.

Gross but mild umbrage. When effervescent programmer Bill Gross gets into a project, he goes whole hog. The developer of the award-winning Hal, which blends a natural-language interface with Lotus' less natural 1-2-3, is the father of Magellan, Lotus' most recent — and perhaps most fun — product ever.

This column recently praised and disparaged Magellan, much like a car with a big engine — great handling, but no brakes. Magellan has brakes, but this text-searching, data-gathering, application-launching utility will have difficulty keeping up with ever-changing file formats and, particularly, graphics files. This would be exacerbated (a college word for made worse) by Lotus' closed attitude toward its 1-2-3 Release 3.0 file format.

Overall, the argument was almost 100% correct, give or take 20% or so. The 20% has to do with Lotus' stance on the Release 3.0 format. According to Gross, who did some swell digging, Lotus will make this file format public in a soon-to-be-released book. This will allow add-in makers to develop products that work with Release 3.0 and will help programs deal with the new file format. What Lotus maintains will be tough to clone is the functionality of Release 3.0.

Gross adds that Lotus will ship new file viewers in batches of 10 for Magellan users and is working on viewers for graphical applications that will provide adequate performance.

Barney is a Computerworld senior editor, PCs & workstations.

IS meets

CONTINUED FROM PAGE 35

ing" — continue independently. Any drive for integration, he said, is coming from the bottom up, as users want access for data to be resident in hosts, thus avoiding reentering information and duplication of effort.

At longtime Macintosh site A. T. Kearney, a management consultancy here, integration has not been an issue. "We have a 1-year-old 3Com Corp. local-area network for the 11 Macs in the production department, and right now we're considering adding a large file server to it — possibly a DEC VAX," said Pat McNamara, the firm's production supervisor.

McNamara said the firm is considering links among its four 3Com networks. But there is no plan to link the production department Macs to the IBM mainframe, which handles accounting applications.

David Henry Goodstein, CEPS conference chairman and Interconsult, Inc.'s president, agreed that some users are reaching the limits of isolated systems and now want access to corporate resources contained in host computers. But a number of IS managers are under pressure to move existing paper-based information such as documentation to on-line systems, Goodstein said, adding that this will require strategies for accommodating departmental-level desktop publishing.

Caterpillar Tractor Co. in Peoria, Ill., has tried to integrate desktop, departmental and production publishing systems for some time. But according to Tom Moore, project leader in the company's publishing systems group, the products shown at the CEPS show did not offer any simple solutions. "I didn't see any products for desktop to corporate-level integration at CEPS," Moore said, adding that he has yet to find a solution for taking text and graphics across all three levels.

For now, Moore said, Caterpillar uses a consistent coding scheme for all text files so that source text can be moved between different hardware platforms, which now include users on stand-alone PCs as well as PCs and IBM Personal System/2s linked to an Atex, Inc. 8000 publishing system and an IBM 3090 mainframe.

Alexander

CONTINUED FROM PAGE 37

work on minicomputer and mainframe networks. Each of these groups has unique needs that must be supported. Local-area networks require greater levels of support than what many IS professionals may realize at first, Frankfeldt points out. What's more, he adds, supporting end users on LANs will be even more time-consuming.

"As PCs mature, and LANs in particular, people would like to be able to get to information in the enterprise," Frankfeldt says. "That's not going to happen from an end user sitting in a department. IS will be responsible for the information architecture that would allow access to the enterprise's data.

"They will also spend more time building the interface between the environment that the user sees on the PC and the data that is relevant to end users," Frankfeldt predicts.

Another trend identified by The Diebold Group is that as end-user computing matures, end users will become producers as well as consumers of information services. That's not so surprising if you consider that end users are already using off-the-shelf software to create applications for themselves as well as others within the organization.

The management consultancy, however, says it believes that emerging technologies such as dynamic document processing and hypertext will require added support from IS. End users will need help in acquiring and using technology that enables them to produce and revise documents on a continual basis as well as provide the distribution capabilities the users need.

End users will be more apt to provide others with information they have generated in the form of a formatted document without assistance from a publications specialist, thanks to desktop publishing tools and "compound documents" encompassing text, sound and still or moving images, the consultants say.

At one time, an end user received computed results that were fixed in schedule and format, Frankfeldt explains. "Subsequently, he could run applications on demand, varying the data to analyze different business operations or scenarios," he says. "Now the end user can develop the presentation format or even the entire application as desired with sophisticated media and tools. In so doing, he increasingly performs IS activities without having a specialized IS background but requires new types of support for the IS function."

Diebold also has found that as end-user computing expands, the traditional services provided by IS decreases. Before that transition takes place, however, IS often finds itself with more than it can manage in both supporting end users and carrying out its traditional duties. IS professionals should be aware that this "bulge" in end-user and traditional responsibilities can consume all of their department's resources, Frankfeldt says. But once through the bulge, the IS department finds its budget is less constrained, primarily because end users assume some of the financial burden.

Alexander is a *Computerworld* senior editor, PCs & workstations.

Wang offers a window with a view

BY DOUGLAS BARNEY
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. loves Microsoft Corp.'s Windows. The minicomputer maker recently announced Clearview, a product that makes this easy-to-use interface even easier.

Wang is strongly backing Windows because the firm views it as an emerging standard, according to Dan Miley, manager of worldwide marketing for systems and communications products. In addition, Windows looks and feels like the OS/2 Presentation Manager and the Open Software Foundation's OSF/Motif — two other possible interface standards.

Priced at $79, Clearview runs on top of Windows and works with existing Windows applications. The system is aimed at individual end users. It reportedly manages and organizes Windows applications and files in a manner that is compatible with the graphical look and feel of Windows. For example, instead of text-based file names used by the Microsoft Windows Executive file manager, users can have icons represent programs. In addition, Windows and non-Windows applications can be accessed from the same menu.

In fact, icons can represent a variety of things, including executable files, submenus, applications or a user-selected combination of windows and icons similar to the way macros automate.

Users can also determine where particular windows will appear on-screen and modify their size. Multiple windows can be arranged in a variety of ways, including overlapping, an aligned grid or front-to-back. Once a user is pleased with the setup, it can be saved. The next time the system starts up, the windows and icons will be just the way the user specified. The system interfaces to Wang's Freestyle image processor.

NEW PRODUCTS

Software applications packages

Lotus Development Corp. has announced Lotus Manuscript 2.1, the latest release of the company's word processing software program.

According to the vendor, the program now includes shading features for highlighting critical information as well as a file conversion utility. Version 2.1 is said to offer support for several printers, including Apple Computer, Inc.'s Laserwriter II NT/NTX and Hewlett-Packard Co.'s Deskjet Plus and Laserjet II-D.

The product will cost $450, according to the company. Registered users of Version 2.0 may upgrade for $20 and registered Version 1.0 users for $75, the company said.

Lotus
55 Cambridge Pkwy.
Cambridge, Mass. 02142
617-577-8500

Engineering Analysis Services, Inc. has introduced a computer-aided piping engineering software application for IBM Personal Computer users.

Tata Micro-Pipe reportedly allows the engineer to determine basic design criteria such as pipeline materials, pressure and temperature. Functions include process flow diagrams, piping and instrumentation diagrams, scheduling and pressure drop analysis. The sample version of the software is available for $50.

Engineering Analysis
691 N. Squirrel Road
Auburn Hills, Mich. 48057
313-377-4200

Utilities

A package of word processor macros that support the Standard Generalized Markup Language (SGML) document markup standard is now available from Allen Creek Software, Inc.

Called Microtag, the macros were developed for users who wish to continue using existing what-you-see-is-what-you-get word processors but find it increasingly necessary to product SGML documents in parallel, the vendor said. It is available in versions for Microsoft Corp.'s Word and Wordperfect Corp.'s Wordperfect and is priced at $49.95 per copy.

Allen Creek Software
1209 W. Huron
Ann Arbor, Mich. 48103
313-663-4248

Overdrive Systems, Inc. has announced Version 2.0 of Overdrive 2, the company's merge and document-assembly program for Wordperfect Corp's. Wordperfect and Microsoft Corp.'s Word word processing packages.

The add-on package reportedly provides a mergelink function for importing data directly from Ashton-Tate Corp.'s Dbase program as well as ASCII and word processing files. Features include pull-down menus and query-by form, and the product is priced at $149.

Overdrive Systems
Suite 260
23811 Chagrin Blvd.
Cleveland, Ohio 44122
216-292-3425

Board-level devices

Profit Systems, Inc. has expanded its Elite series of memory and multifunction boards for industry standard architecture microcomputers.

According to the vendor, the Elite 16 Plus Hypercache was developed for random-access memory-intensive operating environments, and features reportedly include 16K bytes of static RAM high-speed memory cache and optional cache expansion to 32K bytes.

The product operates on Intel Corp. 80286, 80386SX and 80386 AT-based systems, including the IBM Personal System/2 Model 30 286. Pricing ranges from $895 to $1,895.

Profit Systems
30150 Telegraph Road
Birmingham, Mich. 48010
313-647-5010

FTG Data Systems has announced a light-pen interface for PC and AT bus systems. The PXL-380 Precision Light Pen Board half-size card provides a light-pen port for IBM Personal Computers and compatibles, including the IBM Personal System/2 Models 25 and 30.

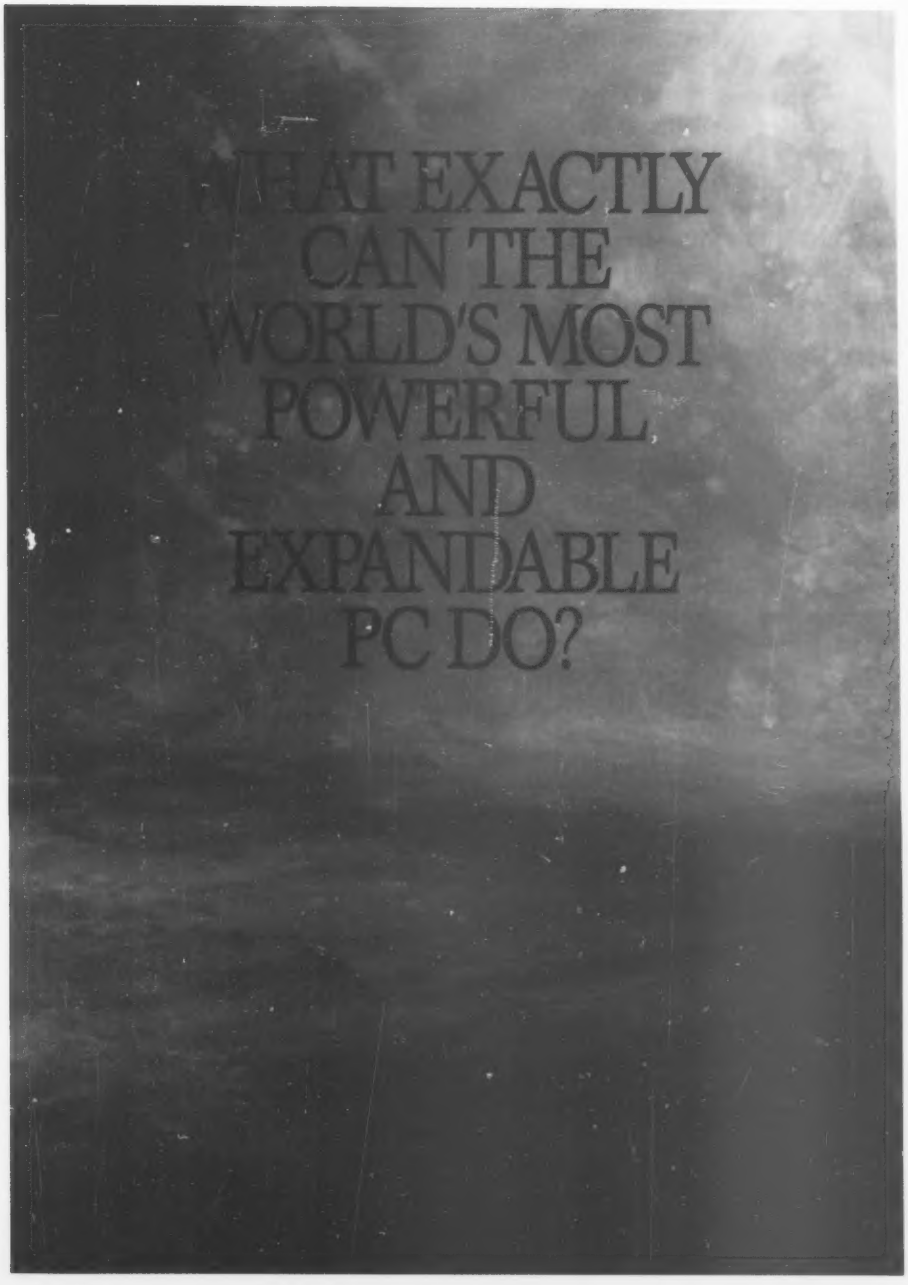
The device is said to support all IBM-standard text and graphics modes and is priced at $189. A five-year limited warranty is included.

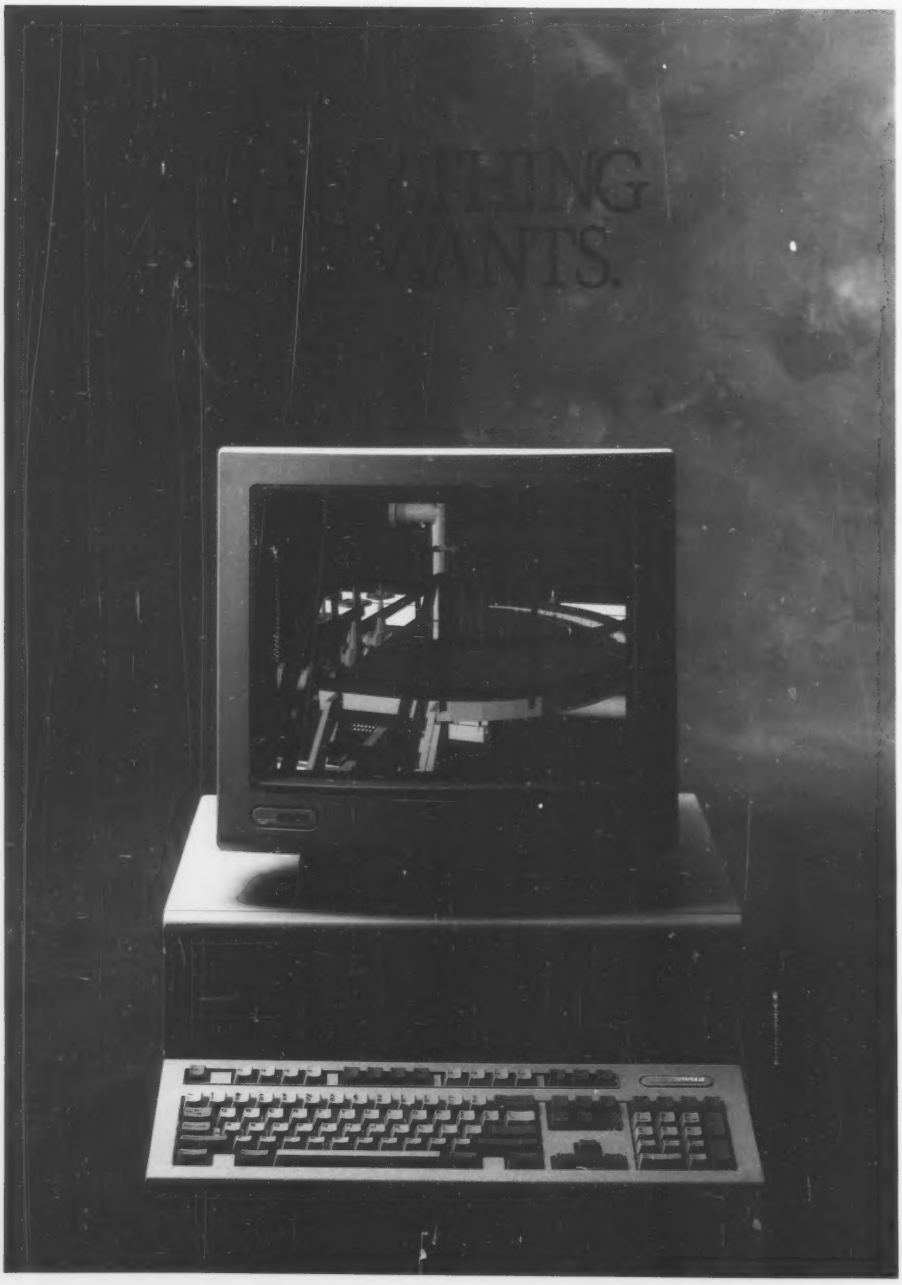
FTG Data Systems
P.O. Box 615
Stanton, Calif. 90680
714-995-3900

An 8M-byte memory expansion board for IBM Personal Computer AT-class users has been announced by Monolithic Systems Corp.

The Justram/ATW single-slot board provides from 1M to 8M bytes of extended or expanded memory in 1M-byte increments and can backfill conventional memory to 640K bytes, according to the vendor. The product is priced from $725, and volume discounts are available.

Monolithic Systems
7050 S. Tucson Way
Englewood, Colo. 80112
303-790-7400


WHAT EXACTLY
CAN THE
WORLD'S MOST
POWERFUL,
AND
EXPANDABLE
PC DO?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ANTS.

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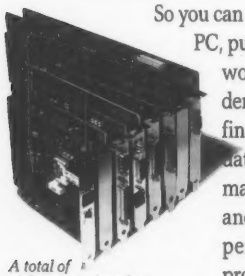

A total of eight expansion slots let you customize the system to your needs by expanding memory and choosing from thousands of industry-standard expansion boards.

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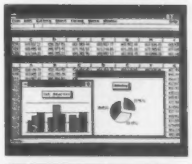

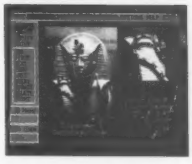

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DATA STREAM

Patricia Keefe

Building without a foundation

Great idea. Lousy packaging.

In many ways, the components that make up the initial installment of IBM's Systems Application Architecture (SAA) were well worth the thumb-twiddling, finger-drumming two-year wait. But pretty concepts alone aren't enough to sell corporate America. It's the underlying structure that can trip up the best-laid product strategies and, in this case, just might.

Last month, zippy colorful menus introduced many users to the first concrete reason they have seen to embrace the OS/2 operating system and Personal System/2 hardware.

The integrated Officevision software is truly the first step toward fulfilling IBM's promise to tie users located anywhere on the enterprise into any of four strategic, but previously noncommunicative, IBM hardware platforms.

In particular, Officevision promises to rescue users from the screen-intensive Profes-

Continued on page 48

Spectrum shows OS/2 version of Xcom

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Users who consider IBM's OS/2 Extended Edition and LU6.2 as not only complementary but also necessary to each other got a helping hand last week when Spectrum Concepts, Inc. announced an OS/2 Extended version of its LU6.2-based file-transfer software.

Xcom 6.2 for OS/2 is "important because it provides independent LU support, allowing sessions over a Systems Network Architecture backbone for a variety of systems," including all major IBM systems, Unix systems and Digital Equipment Corp. VAXs, a Spectrum Concepts spokesman said.

The software program is said to automate much of the file-transfer process, allowing users to carry on traditional, CICS-to-3270 sessions while the OS/2 Extended workstation does bulk file transfer with one or more hosts over peer-to-peer links with the same or other hosts, the spokesman said.

Chrysler Corp. is currently evaluating Xcom 6.2 for just such an application, according to Marty Cummins, who heads the auto maker's LAN Connectivity Group. If all goes well, the product will allow programmers on Personal System/2s running OS/2 Extended to distribute software updates to some 6,000 remote sites via an LU6.2-based connection with IBM mainframes, Cummins said.

Chrysler is also considering a 3270-based connection from Digital Communications Associates, Inc., but it would be better to use LU6.2 because "we don't want to saturate the 3270 system with LAN-based work groups," he added.

Chrysler management considered at one point the idea of using the OS/2 Extended servers rather than mainframes as software distribution centers, Cummins said.

"The problem is capacity: No one has figured out how many modems and servers would be needed, while we know the host is well-suited" to such an application, he added.

Using OS/2 Extended servers and LU6.2 connections is likely to be part of "Phase 2 of networking" at Chrysler, Cummins said. Another potential use for Xcom 6.2 is as the foundation for a peer-to-peer, local-area network-based communications system between Chrysler and its dealers, he added. OS/2 Extended servers would act as liaisons between a variety of third-party systems used by dealers and Chrysler hosts, which should not be accessible directly by third-party systems, according to corporate policy.

Spectrum Concepts hopes by year's end to have redesigned the entire Xcom 6.2 line to comply with the user presentation interface specified by IBM's Common User Access, the spokesman said. A Microsoft Corp. OS/2 version of Xcom 6.2 will also become generally available at an undisclosed date.

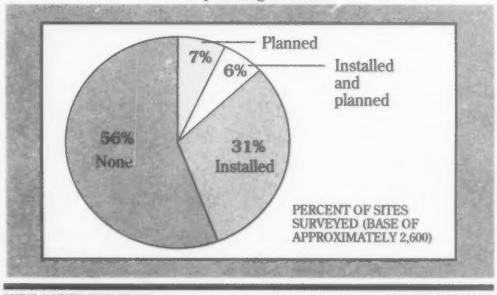
Xcom 6.2 for OS/2, scheduled to ship next month, costs $950.

Inside

Data View

T1's fortune

Nearly half of medium to large computer sites surveyed are using or planning T1 links



SOURCE: COMPUTER INTELLIGENCE

CW CHART: DOREEN DAHLE

No safety net in sight

Innovations leave systems to flirt with disaster

BY MITCH BETTS
CW STAFF

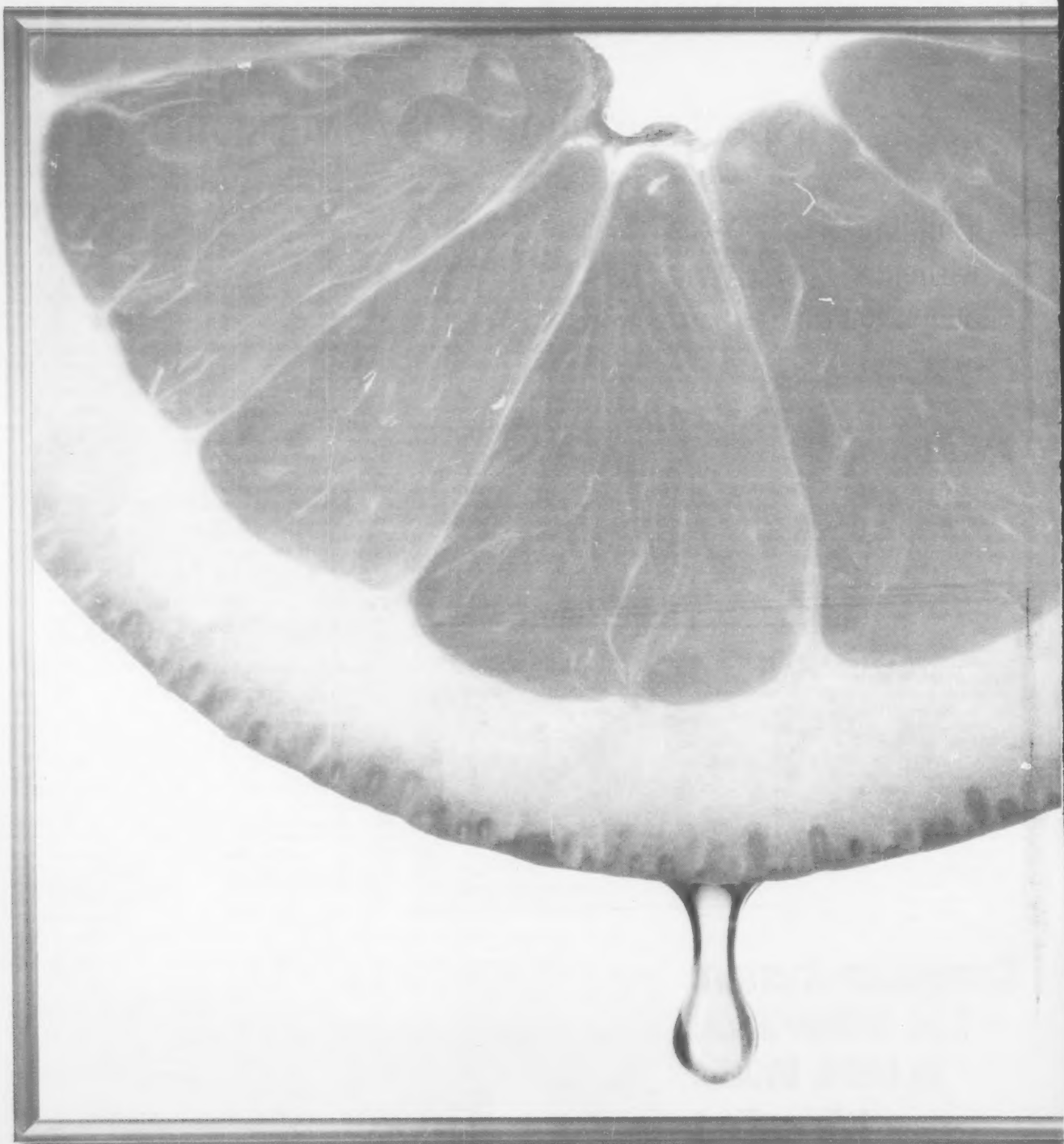
WASHINGTON, D.C. — Some of the technical advances that long-distance carriers are pursuing to entice big-business customers are also leaving the nation's telecommunications system more vulnerable to disruption by accidents, natural disasters and sabotage, according to a National Research Council study.

The May 1988 fire at a Hinsdale, Ill., central office, which disrupted numerous business networks, was an early warning sign that more attention should be given to building route diversity, redundancy and security into the public-switched network, the study said.

Released by the research council last month, the report cited these trends as worrisome:

- Long-distance carriers are offering business customers access to their network software

Continued on page 45



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—Jack Carnine, V.P., Products Group
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Chase takes multivendor route to value

ON SITE

BY ROBERT MORAN
CW STAFF

NEW YORK — The Chase Manhattan Bank NA creates its own bargains with a steadfast multivendor approach to achieving cost-effectiveness, diversification and operational redundancy in its global telecommunications network.

The nation's second-largest bank has parlayed its strategy into an annual 10% decrease in costs while increasing its voice and data transmission volumes.

Elaine Bond, senior vice-president of corporate systems, said Chase Manhattan is "multivendor and will in fact shop." Bond, interviewed after Chase signed a multimillion-dollar contract that gave MCI Communications Corp. a portion of the bank's worldwide network, said, "We will use whoever has a good service we think our customers will want to use."

Costs aside, the bank takes the multivendor approach to ensure that it has diverse routing and redundant operations. However, a contract signature is no guarantee of diversification. "You have to be very careful that you know exactly what routing they [the vendors] are going to give you," Bond said, "because the vendors themselves buy for one another."

Bond added that choosing different technologies is another way to guarantee that transmissions travel over diverse connections. Among the many technologies the bank uses are fiber optics and satellite communications. It is also on a "strategic kick with Netview" in an attempt to increase reliability through centralizing and automating network management and network operations.

YVONNE HEMSEY/GAMMA-LIASON

Chase's *Bond shops around*

Consolidation of individual circuits into T1 backbones is another method by which the bank hopes to reduce its telecommunications budget, Bond said. "By moving traffic that had been off of the network onto the network," she said, "we have achieved better utilization of our network structure."

Although no single factor has been the sole contributor to bottom-line savings, Bond said that negotiations with vendors, especially for volume discounts, have contributed substantially to the bottom line.

To that end, vendors meet two teams when vying for the bank's business: a combined technical and a financial team, which knows what to look for from a vendor, and contract negotiators.

In addition, Bond said that the bank examines its vendors very closely. "We scrutinize our billing to make sure we are paying for what we get and not paying for what we don't have," she said.

Although financial teams examine all bills, Chase Manhattan also hires the services of consultants who inventory the bank's communications bills for discrepancies, charge a percentage of savings as their fee and help the bank negotiate with the telephone companies, according to Bond.

> CONSOLIDATION of individual circuits into T1 backbones is another method by which the bank hopes to cut its telecommunications budget.

The MCI contract calls for redeploying a portion of the bank's global telecommunications network.

In 1988, MCI netted a 250% increase of the bank's domestic voice traffic and a 30% increase of its international traffic during 1987, according to an MCI spokeswoman.

Although neither MCI nor Bond would disclose the value or duration of the contract, the MCI spokeswoman said that the agreement had a projected 1989 value of approximately $10 million. Bond said that the bank's voice and data traffic has increased with other vendors as well.

MCI will also supply services such as artificial intelligence for telex, advanced MCI 800 features and MCI Mail for electronic transmission of financial reports.

The telex services use AI technology to lessen manual handling of messages. The AI component, which was developed with the help of the bank's AI team, interprets key aspects of messages and helps to structure them, said Bond, who added that the bank is negotiating with other vendors for similar applications.

Consistent with its multivendor approach, the bank will also use other electronic mail providers to transmit financial reports.

Cost reduction is a big item at the bank, Bond said. "It is important for us to ensure that we are efficient," Bond said, "but it is important for us not to sacrifice cost efficiency for effectiveness."

Intelligent networks steal show

But customers may have to wait for the enhanced management capabilities

BY ELISABETH HORWITT
CW STAFF

ANAHEIM, Calif. — A bevy of host-based communications platforms, decked out with the latest connectivity protocols and capabilities designed to add intelligence to regional carriers' network services were the star attractions at the recent Supercomm '89/Network '90s conference.

But customers may have to wait a while before they can enjoy the enhanced management capabilities, information services and other bounties provided by such services, according to one analyst.

Jeremy Frank, a program director at Stamford, Conn.-based market research firm Gartner Group, Inc., heralded the Supercomm announcements as "dazzling."

Word of caution

However, Frank cautioned that the Bell operating companies (BOC), which still enjoy virtual monopolies of the local loop, have little competitive motivation to install such sophisticated systems at their central offices.

"If the BOCs are dragging their feet on providing regular network services such as fractional T1, what will they do with enhanced services outside their purview?" Frank said.

Local carriers, host vendors and central office switch vendors put on a brave show of intelligent networking products and alliances at Supercomm, held here two weeks ago. One major focus of the show was host-based communications platforms designed to bring standards-based intelligent networking to the central office.

For example, Stratus Computer, Inc. introduced OSI Server, which is said to lay the groundwork for its XA 2000 Continuous Processing Systems to support such Open Systems Interconnect-compatible networking applications as X.400-based electronic mail or electronic data interchange (EDI), Stratus said.

> "IF THE BOCs are dragging their feet on providing regular network services such as fractional T1, what will they do with enhanced services outside their purview?"
>
> JEREMY FRANK
> GARTNER GROUP

Stratus is positioning the XA 2000 line as adjunct processors that will support such intelligent networking applications on either a carrier's or a business user's network switch, the company said.

Digital Equipment Corp. and Northern Telecom, Inc. each made a strong showing as well in the OSI-compliant intelligent networking front.

The two companies, in conjunction with regional holding company Nynex Corp., announced the trial of a high-capacity digital data communications service based on the industry standard. The service will use Northern Telecom's DMS Supernode intelligent central-office switch and DEC's Decnet Phase V routers to provide OSI-compliant file transfer, intercomputer transactions and remote terminal sessions for Nynex customers. The trial service will be available through Nynex's Switchway Switched 56K bit/sec. service and Superpath T1 service, according to Nynex.

DEC-Pacific Bell pact

DEC also announced an agreement to help Pacific Bell set up an EDI service. The EDI offering will be part of the local carrier's Connection, an X.400-compliant E-mail service that DEC helped develop under an existing contract.

Northern Telecom announced Netmate, a set of software tools designed to help carriers design, simulate and configure its networks from a personal computer.

Unisys Corp. announced and demonstrated Network Access Platform, an applications platform designed to support a variety of carrier-based intelligent networking applications, the vendor said.

The applications platform is part of Unisys' push to form alliances with telecommunications service organizations through its Computer Marketing Development division, according to the vendor.

Obstacle course

The Supercomm conference introductions are the latest additions to a raft of breakthroughs in the telecommunications industry in the past few months. But barriers to implementation remain, according to Jeremy Frank, a program director at Gartner Group and a former employee at Pacific Bell.

"We've finally migrated from copper to fiber, from analog to digital," and fractional T1 and wide-band networking services are becoming available as well, Frank said. But the Bell operating companies (BOC) will continue to act as a bottleneck, preventing these breakthroughs from extending all the way to the local access loop, "at least until Judge [Harold H.] Greene redefines the landscape or the Public Utility Commissions open up the local loop to true competition," he said.

Something to BOC at

With the local loop transport market lucrative but flat, the BOCs face a dilemma when it comes to expanding into the enhanced networking services that they recently got regulatory permission to enter, Frank said.

"All of them are drooling at the margins [that enhanced services offer]; but it takes understanding in sales and marketing to sell an application rather than just transport" — expertise that the BOCs have already proved they lack, according to Frank.

One factor that could change the BOCs' behavior, Frank said, would be strong evidence of demand for intelligent services from major corporate users. Several telecommunications managers have recently expressed dissatisfaction to *Computerworld* about the slow rate at which their BOCs were introducing enhanced services.

"I really think that Nynex has not come across as quickly as its customer base would like on certain things, like ISDN," said Dennis Murphy, former director of telecommunications at Warner Communications, Inc.

"In the long run, many regional BOCs don't realize that their most successful strategy is to make large users successful," said Kenneth Phillips, who is the chairman of the Committee of Corporate Telecom Users and a vice-president at Citicorp.

ELISABETH HORWITT

Safety net

FROM PAGE 41

and databases for purposes of network management and configuration. The concern is that computer hackers, saboteurs or disgruntled employees could use this opening to damage the network's routing software.

- The trend toward high-capacity, fiber-optic cables leads to fewer geographic transmission routes and increases the concentration of traffic on those routes.
- Similarly, the use of high-capacity digital switches results in fewer switching centers, with each one handling more traffic.
- Competition has led to a proliferation of networks and vendors. Although this provides some network redundancy, the diversity also creates technical incompatibilities, so it is not clear whether one network could provide backup for another. Moreover, some of the transmission lines are laid along the same bridges, highways and other rights-of-way.

"If fire destroys the only central switching office that can route emergency traffic from a given area or if an earthquake uproots critical optical fiber transmission lines, essential communications linkages will be severed," the report said.

Simply put, "it is becoming increasingly easy to make the public-switched networks inoperable," the study warned.

One of the study's recommendations said the U.S. government should explore ways to "exploit the capabilities of private networks" to augment the public network during emergencies.

However, the report said private networks will be useful only if they employ protocols and interface gateways that are compatible with public-network standards and if the gateways can be tested periodically.

The study was conducted for the manager of the National Communications System (NCS), a special unit of the U.S. Department of Defense created after the Cuban missile crisis of 1962 to improve communications during national security crises.

In its recommendations, the council said the NCS manager should avoid overreliance on fiber lines and explore the use of cellular radio and satellites to provide alternate routes. Some businesses used very small-aperture terminals to bypass the Hinsdale office last year, according to the report.

In addition, the council recommended more security controls for network software and supported the NCS plan for a special voice/data network to provide service for 30,000 government users during and after a military attack.

Throughout the report, there is a trace of nostalgia for the pre-divestiture days of the Bell System, which featured a unified national network, standardized interfaces and an AT&T-operated national emergency center.

The changes wrought by the 1984 divestiture have fragmented the national network and made emergency planning more difficult, according to the report. Indeed, the Defense Department opposed the AT&T breakup on the basis of national security.

The panel that produced the report "Growing Vulnerability of the Public-Switched Networks" was chaired by John C. McDonald, vice-president and chief scientist at Contel Corp. in Atlanta.

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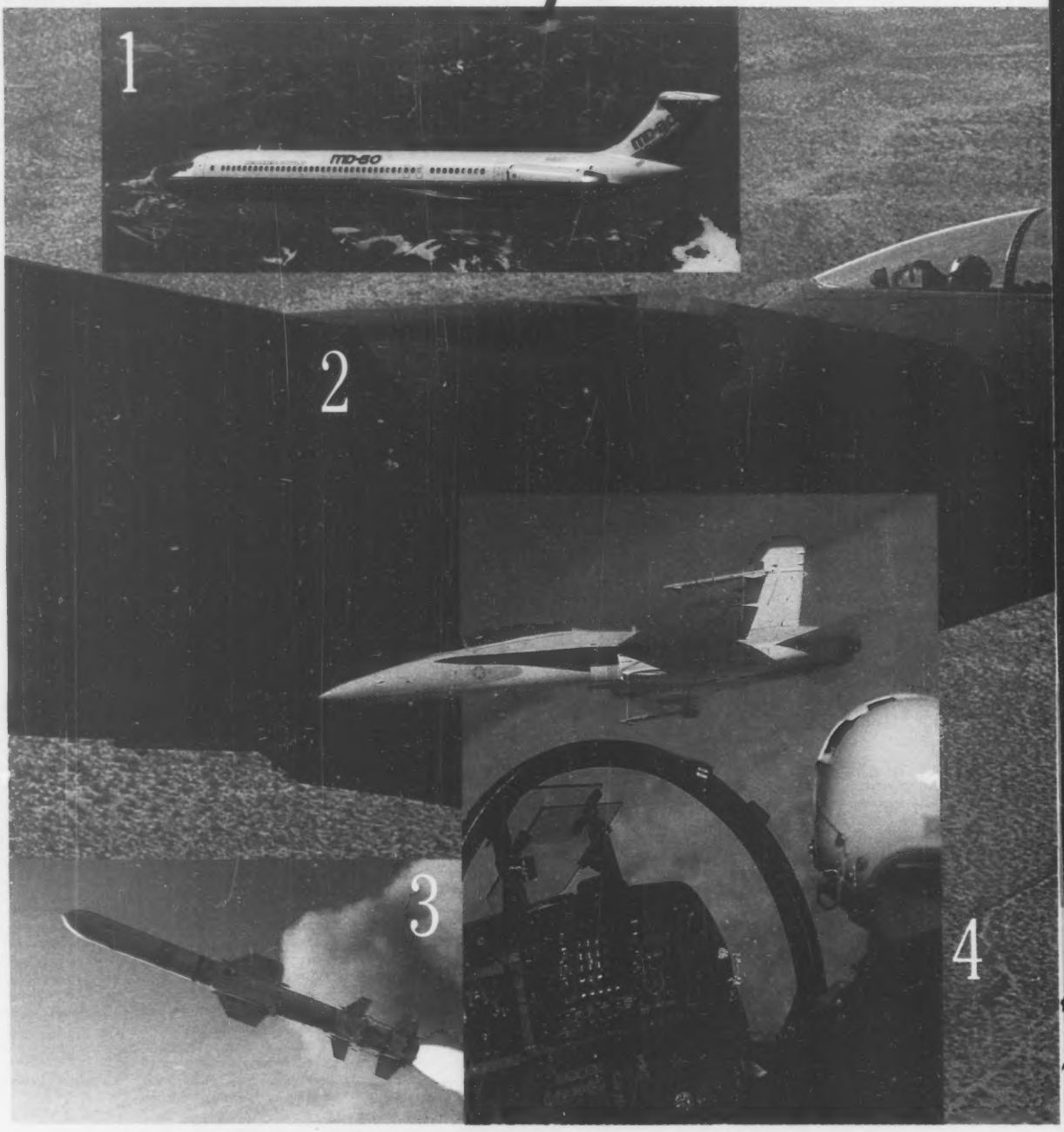

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MCDONNELL DOUGLAS

A company of leaders.

Keefe

FROM PAGE 41

sional Office System and its clumsy interface.

In addition, a couple of long-standing questions were cleared up. Yes, IBM will condescend to talk to Ethernet; and yup, as was suspected, IBM will support Microsoft's OS/2 LAN Manager application programming interfaces.

And there was yet another gracious bow in the direction of Apple — iconic interfaces. What do you know about that?! Better yet, IBM was talking product shipments in four months. Heck, what's a quarter when you've already waited two years?

Yes, on the surface, there sure was a lot to smile about. IBM has thrown a hell of a forward pass. All that remains now is for users to catch it en masse, carrying IBM forward into the end zone of prosperous quarterly earnings.

But after they got past the "wowie-zowie" stage, many users were left squirming. Instead of clapping their hands, many are so busy wringing them that they may drop the pass. In short, they are uneasy — and with good reason.

I predict OS/2 Extended Edition 1.2 will be the thorn in the side of Officevision/2 LAN Series. For months, IBM and Microsoft have been desperately trying to sell users on the wonders of OS/2 Standard Edition, never mind its 4M-byte memory requirements and limited applications availability. It's gotten such a frigid welcome that both firms were forced to roll out rebates. Even that has yet to fire up the so-far glacial move toward OS/2 implementations.

> IBM HAS THROWN a hell of a forward pass. All that remains now is for users to catch it en masse.

Most users have invested heavily in networks running Novell and 3Com network software. They are still in the process of migrating their users from Intel 80286 to 386 workstations; they haven't even gotten to the operating system yet.

So what does IBM come up with? A great product concept that unfortunately requires a PS/2 Model 70 (forget the Model 50Z), about 8M bytes of memory and OS/2 Extended Edition 1.2 — not just on the server but on the workstation too.

If you look closely at IBM's "Ivories," Standard Edition seems to have vanished overnight from its vocabulary. Product specifications pound home the point over and over — support for Extended Edition, DOS or nonprogrammable workstations. So why the urgency to push Standard Edition even just a week prior to the Officevision announcement?

There's clearly a need for Extended Edition at the server — that's where you get the required LU6.2 and X.25 connectivity support. But at the workstation?

We are talking major greenbacks here, not to mention wholesale migration at the workstation, operating system and network levels. Yet when we, Microsoft and others asked IBM, both at the press conference and in interviews later, to explain why you can't or shouldn't use Standard Edition on the desktop, we couldn't get an answer.

Maybe IBM has something up its sleeve that will make this all crystal clear at some point down the road. But that doesn't help users making technology decisions today. Users need reassurance that their network investments will be supported under SAA, and they need solid reasons why they should choke down Extended Edition and its horrendous memory requirements at the desktop.

Users need answers, and without them, all the rebates in the world won't help IBM sell Officevision.

Keefe is a *Computerworld* senior editor, networking.

GM exhibits money-saving MAP

BY ELLIS BOOKER
CW STAFF

DETROIT — General Motors Corp. recently showcased some of its top manufacturing technologies — computerized design and production methods that GM officials said will save the company $100 million annually.

Company officials attributed GM's strides in improved quality and reduced costs to manufacturing systems, which he called "the silent partner" in GM's business.

The emphasis is warranted. A large chunk of GM — $39 billion — is represented by property, mostly plants and equipment, according to Gerald L. Elson, executive director of advanced manufacturing engineering.

"We spend billions every year investing in new buildings and machinery. And we spend billions in maintenance," Elson said, adding that "there is great untapped potential" to reduce these costs by more closely knitting together the manufacturing and product design processes.

Elson said GM, a vertically integrated organization, can quickly convey information about new procedures throughout the company. "We will achieve a competitive advantage because of our integration," he said.

The exhibits at GM's Advanced Manufacturing Engineering Team Center in Warren, Mich., included robotic vision, expert systems and automated laser welding gear.

MAP looms

But the largest of the 17 displays was a computer-integrated manufacturing demonstration using the Manufacturing Automation Protocol (MAP) network protocol. MAP is the common communications protocol for multivendor, multiequipment networks that GM has championed in the past five years.

To date, MAP networks are installed at 18 GM plants, and GM said another eight facilities are deploying the latest implementation of the communications architecture MAP 3.0.

"Within the next six to nine months, you'll have plug-and-play," said Michael A. Kaminski, manager of MAP communications at GM, who predicted that major vendors would rally behind the MAP 3.0 standard, introduced last June.

A common systems approach such as MAP is important for GM because, like other large manufacturers, it maintains a sprawling supplier list. Last year, Elson noted, GM bought capital equipment and tooling from 10,000 different suppliers and robots from another 64 companies.

GM's Elson *sees untapped potential in MAP methods*

In addition to connecting diverse systems physically, GM also wants to use those devices and processes more efficiently and thus has invested heavily in expert systems and artificial intelligence. Ruth M. Zarger, director of GM's cognitive systems group, noted that even during the lay-offs that hit the automobile industry at the start of the decade, GM expenditures for expert systems technology grew.

Meanwhile, GM is learning how best to use computerized diagnostics in plants and sometimes opting for lower-tech solutions.

Harlan Neuville, director of machine intelligence, said the goal of these more primitive systems is to not make decisions. Rather, a machine intelligence system detects a flaw and immediately alerts a human operator. "It's inspection by exception," Neuville said, adding that this technology, often built from off-the-shelf systems, is cheaper to use and deploy.

GM officials said they are publicizing only about 5% of all the new manufacturing technologies they are exploring. Regarding future plans to market these technologies to others, Elson said, "Money won't be made in licensing but in the impact [of these systems] on GM's business."

NEW PRODUCTS

Local-area networking hardware

Sun Microsystems, Inc. has announced that its Sun 386I workstation now connects to most popular personal computer local-area networks.

By supporting Novell, Inc.'s Netware and 3Com Corp.'s 3+ LANs, the workstation reportedly can be linked to more than 60% of existing PC networks. Support for Novell Netware 2.1 running over Ethernet or Token-Ring networks will be included in SunOS 4.0.2., scheduled for release in July. Pricing for the workstation begins at $8,990 and includes high-resolution monitors and disks.

Sun Microsystems
East Coast Division
2 Federal St.
Billerica, Mass. 01821
508-667-0010

Computrol, Inc. has introduced a Manufacturing Automation Protocol (MAP) network interface controller board designed to link IBM Personal Computer ATs, XTs and compatibles together on a network.

The Model LP-25 controller is a single board that fits the PC bus design and runs Layers 2 through 7 of the MAP and 802.4 protocols, according to the company.

The product is based on a 12-MHz 32-bit Motorola Corp. 68020 microprocessor and reportedly delivers up to 75K byte/sec. across a MAP network from one application-level task to another. Pricing begins at $2,300.

Computrol
239 Ethan Allen Highway
Ridgefield, Conn. 06877
203-431-2000

A personal computer peripheral-sharing network has been introduced by Equinox Systems, Inc.

Targeted at the eight- to 16-user work group, Alternet allows users to share printers, modems and mainframe computer ports, as well as perform file exchange functions, the company said.

The product reportedly supports both parallel and serial printers and is priced at $995.

Equinox Systems
14260 S.W. 119 Ave.
Miami, Fla. 33186
305-255-3500

Arche Technologies, Inc. has introduced two Arche Netshare local-area network interface cards for use with Ethernet- and Arcnet-compatible networks, the company said.

The Arche Netshare-E Ethernet interface card is reported to be Novell, Inc. Netware compatible and implements the 802.3 Ethernet standard.

Three levels of loopback are offered for diagnostic functions, according to the vendor. The card is priced at $295.

The Arche Netshare-A interface card is also Netware-compatible and reportedly implements a modified token passing scheme, Arche Technologies said.

The device was designed to network both proprietary workstations and IBM Personal Computers and compatibles.

Arche Netshare-A carries a price tag of $165.

Arche Technologies
48881 Kato Road
Fremont, Calif. 94539
415-683-6760

A local-area network file management and retrieval system said to be integrated across both magnetic disk- and optical disk-based network servers has been announced by Syntrex, Inc.

The Optical Archiver has an option with the company's Document Manager filing and retrieval system and is targeted at businesses that need to access documents, spreadsheets, databases and reports for lengthy periods of time, the company said.

The product is priced at approximately $8,000 and includes the Optical Archiver software for Document Manager, an optical subsystem and an administrative software package for an IBM Personal Computer AT-based optical storage and retrieval server.

Syntrex
246 Industrial Way W.
Eatontown, N.J. 07724
800-526-2829

EXECUTIVE TRACK

Robert L. Malizia has been promoted to vice-president for management information services at **Firestone Tire & Rubber Co.** in Chicago.

Malizia, 48, joined Firestone as manager of electronic data processing customer services in 1984.

He was subsequently promoted to director of computer and communications services in 1985 and had been executive director of MIS since August 1988.

The Michigan native earned both his bachelor of science degree and his master's degree in business administration from Eastern Michigan University.

.....

Richard Commander has been named vice-president of System 21 implementation at **Blue Cross & Blue Shield of Massachusetts** in Boston.

Commander will be responsible for directing the development of System 21, the company's new cross-functional enrollment, billing and claims-processing system.

Commander was previously assistant vice-president of corporate operations and assistant vice-president of claims operations. He joined Blue Cross & Blue Shield in 1971 as a statistical analyst.

Commander holds a bachelor's degree from the University of Notre Dame and a master's degree in business administration from Boston College. He resides in Marshfield, Mass.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor-Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

A high degree of favor

Decision to forgo MBA has not blocked Chism Mackie's path at Transco

BY ALAN J. RYAN
CW STAFF

The one thing Susan Chism Mackie says she truly regrets is her decision not to pursue a master's degree in business administration after graduating from Vanderbilt University. At the time, the Arkansas native felt she had had enough schooling.

Today, the walls of her spacious 29th-floor office offer plenty of surface upon which to hang the parchment, but as vice-president of information services and chief information officer at Transco Energy Co. in Houston, Chism Mackie, 42, has no time for classes. She has held the position at Transco, which last year reported sales of $1.2 billion, for the past four years.

No matter. MBA-less as she is, she's still got plenty of respect from the top at Transco. "These days, being able to convince everybody that a woman can make it in an energy company, can make it managing a lot of technocrats and can fit in very well with a lot of men — which is the case here — is a real credit to her," says Transco Chief Executive Officer George S. Slocum.

Transco's 64-story corporate headquarters tower, fashioned after the Empire State Building in New York, bursts from the Houston soil and can be seen for miles around. Likewise, the influence of the demanding Chism Mackie and her department looms over Transco. "Susie is one of those people who goes in about 100 directions at once," says Lynn Haltom, director of gas information systems.

In 10 years at Transco, Chism Mackie has climbed the systems ranks through data administration jobs to manager of data administration, director of systems and vice-president, becoming Transco's only female corporate vice-president to date. In that time, the company's 10-year systems plan has evolved as the gas industry, government regulations and systems have changed, Chism Mackie says.

Although Chism Mackie says she is no Superwoman, that can be difficult to believe. Until her marriage a few weeks ago, she was a divorced woman raising two teenage daughters and juggling her time among her job, family and the family's weekend retreat — a farm where she raises 16 racehorses, including a grandson of the famous thoroughbred Northern Dancer.

"I can't help but have tremendous respect for the way she tries to keep her priorities straight," Haltom says. "Those girls are everything to her, and she takes the time to talk to her kids."

Talking to her daughters does not always bring about the results Chism Mackie would hope for, though, especially when it comes to encouraging them to study hard in school. "They say, 'Why would we want a job like

Continued on page 53

PROFILE: Susan Chism Mackie

JIM CALDWELL

Position: *Vice-president of IS and chief information officer, Transco Energy Co.*
Mission: *To complete Transco's 10-year systems plan while maintaining good employee communications within the company*

New ASM chief touts broad IS approach

BY CLINTON WILDER
CW STAFF

James W. Prickitt has seen many different facets of the information systems profession in his 30-year IS career. Now, as the new president of the Association for Systems Management (ASM), he wants to encourage his colleagues to do the same.

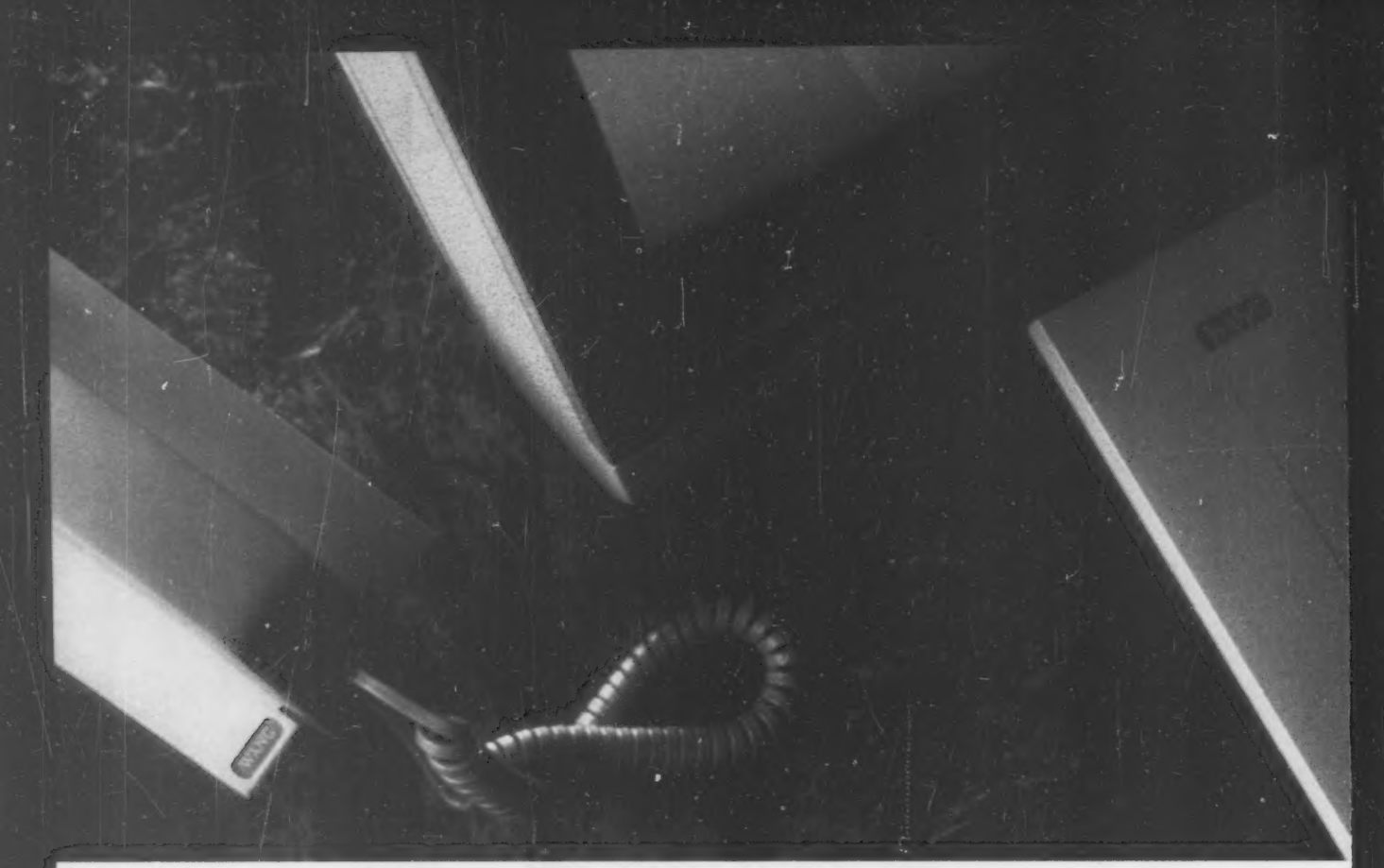
"I call it the Renaissance man approach to systems work," said Prickitt, who took over the one-year elective position last week. "There's so much new technology that the people who understand where the pieces fit have a leg-up. If you get too specific in one technology, you get locked in and can't see the forest for the trees."

Prickitt is in his 20th year in IS at San Francisco-based Chevron Corp., where he supervises the litigation systems group. At Chevron, he has worked on office, transaction and general data processing systems. Before that, he was IS manager of the former Southwest Airlines (now part of Northwest Air Lines), where he "did a little bit of everything," he said.

Prickitt's goal for ASM during the coming year is to broaden the technology and management horizons of its members. There is plenty of diversity within the 9,000-member association, Prickitt said, but people focus their careers too often on a single specialty.

"Our membership has always been broad-based, from engineers to top managers," he said. "But we want all of them to have a better chance to absorb a broader view of the world — how best to use the technology in their businesses and the effect of one piece on another. Associations haven't always understood that — they don't always look beyond the special-interest groups."

Prickitt said ASM hopes to recruit more of what he calls end-user counselors — professionals, either with or without traditional IS backgrounds, who have become the personal computer technology gurus of their work groups or departments. "We want to help him pick up the broader systems background that's necessary to do his job better," he said.



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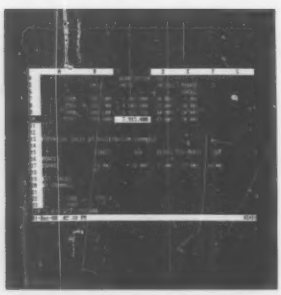
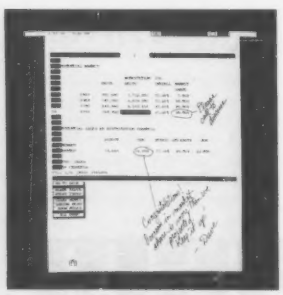
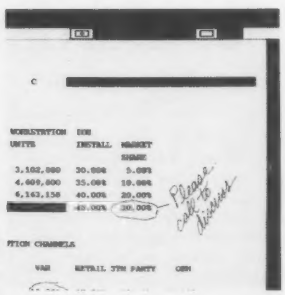


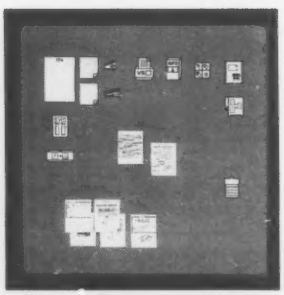
Now you can review, comment on and approve information on a computer as clearly and as easily as you would in person.



You use the stylus just like a pencil. And your handwritten notes, questions and signature appear right on your screen.

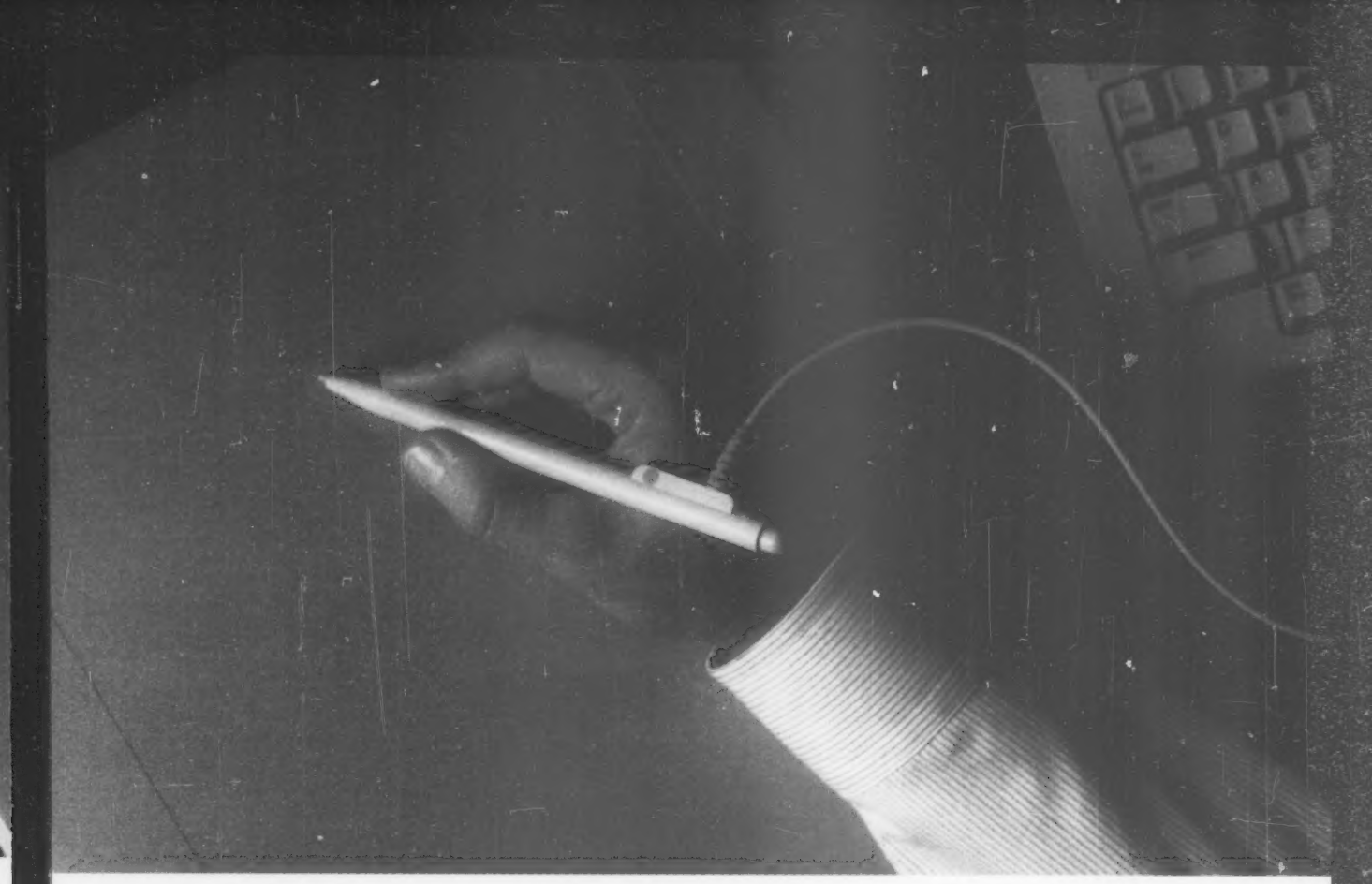


Voice comments are just as simple. Pick up the Freestyle handset and talk.



The Freestyle system even lets you arrange and rearrange your Freestyle "desktop" exactly the way you would your own desk. Stack individual pages, staple them together, move them, spread them out or throw them away.

Actual Wang computer screens shown here.



It's Freestyle from Wang.

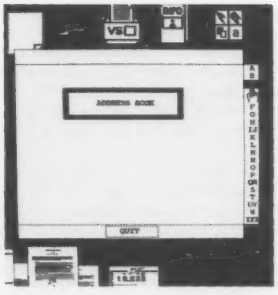
Freestyle™ combines the speed of the personal computer with the simplicity of natural communications. It lets you communicate clearly and rapidly with your entire organization – on a personal level – without ever leaving your desk.

FREESTYLE

Freestyle isn't a machine or another PC. It uses a personal computer, but you don't. It lets you add your own questions, comments and directives – written in your own hand and spoken with your own voice – to the Freestyle screen. Freestyle can be used with either scanned or FAXed information or information generated by any PC system.

With Freestyle you don't work differently, just more effectively. It enhances the skills you already have, it doesn't change them. And if you know how to use a pencil, paper, and phone, you already know how to use Freestyle.

Freestyle from Wang. A dramatic breakthrough in communications that's incredibly simple.



Right from your Freestyle "desktop," you can mail a Freestyle page via a computer network or FAX it, find out where it's been, select another document to review, create a new one, or print it.

WANG

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For a Freestyle demo videotape, call 1-800-522-WANG. Or write Wang Laboratories, Attn: Inquiry Service, M.S. 014-03C, One Industrial Avenue, Lowell, MA 01851.
In Canada, call 1-800-263-3065. Or write Wang Canada, Attn: Marketing Department, 66 Leek Crescent, Richmond Hill, Ontario L4B 1J7.

The key to strategic IS advantage: People

BY TOM BYRNES
SPECIAL TO CW

LOS ANGELES — Information technology will be a critical component of competition in the 21st century, but the people using the technology will separate the winners from the losers.

This was the consensus of a panel of chief executive officers and executive vice-presidents from the banking, pharmaceutical and information services industries who took part in a recent University of California at Los Angeles-sponsored symposium entitled "The Decade Ahead — Gateway to the 21st Century."

"The computer is a business tool," said Emil P. Martini, chairman and CEO of Bergen Brunswig Corp., a pharmaceutical distributor. "But it will be a company's ability to provide that extra level of support and personalized service that will set competitors apart in the years to come.

"People's roles are often shifted rather than lost," Martini added. "While we have replaced our telemarketing staff with a computer-based ordering service, we still use the folks who had manned the phones to place follow-up calls."

The symposium, which drew 150 chief information officers, consultants and academics, was the inaugural event of the Anderson Graduate School of Management and its Information Associates program, which is hoping to create a forum in which business leaders and educators can discuss future IS strategies.

"Technology is important; no one questions that," said James F. Montgomery, chairman and CEO at Great Western Financial Corp. "But it has to be seen as a support tool. There is no replacing personal interaction between managers and their staffs and the company and its customers."

Martini said he believes electronic data interchange can be used to create the reality of a "storewide perpetual inventory" system between drugstores and his distribution operations. Artificial intelligence and executive information systems can be used to analyze business problems and provide a variety of possible solutions in an easy-to-read format.

By increasing the ability to fill orders quickly while improving management's awareness of the options at hand, a company can rapidly react to shifting market conditions on a number of levels.

This need to provide decision-support tools to assist managers faced with changing business requirements was echoed by Richard D. Whilden, an executive vice-president at TRW, Inc.

"TRW's use of modeling applications to improve our business decisions has shown us that these tools are also useful to our customers in their marketing efforts," Whilden explained. "As workstations become more prevalent, even smaller companies will be able to develop models of their targeted customer base and then calculate the return on proposed marketing campaigns before they initiate them. It will make them more effective enterprises as well."

> "IT'S TOO EASY to let these programs overcalculate things and take a user out of the decision-making loop. You can't forget to trust your own business sense and intuition."
>
> JAMES F. MONTGOMERY
> GREAT WESTERN FINANCIAL

While the proliferation of such programs among a broader range of users may be interpreted as a signal that high technology is finally becoming a commodity, it was clear that the role of the individual will not be displaced.

Montgomery outlined the types of modeling programs and executive support tools used by Great Western in its move to become a leader in the savings and loan industry, but he was quick to point out the potential hazards of becoming too reliant on information systems.

"You have to be careful," he warned. "From a management viewpoint, it is important to keep reports easy to read, frequently updated and designed to focus on the 'what ifs' of contingency planning. It's too easy to let these programs overcalculate things and take a user out of the decision-making loop. You can't forget to trust your own business sense and intuition."

The human aspect of future business strategies also proved to be a hot topic during the question-and-answer session following the discussion. When asked if increased automation meant that the role of individuals or personalized service would be displaced by technological substitutes, the panel responded with a unanimous no.

Whilden asserted that "commerce is — and will remain — people doing business with people. Since technology is only an aid in enhancing people's capabilities, human nature will still play a predominant role in the way things are done."

Byrnes is a strategic marketing consultant and writer in the Los Angeles area.

TAKING CHARGE

Clinton Wilder

Wall Street II: The IS factor

One of the hottest IS issues this year has been the spirited debate about how to value information systems. Most progressive thinkers in the field agree that systems should be viewed as an asset rather than a cost. But the debate proceeds to such issues as depreciation rules, return-on-investment formulas and the enigma of quantifying the competitive advantage gained through a particular system.

These are tough nuts to crack and are unlikely to be resolved anytime soon. But just for fun, let's take a look at a world in which IS capabilities have found their way onto the corporate balance sheet along with bricks, mortar and goodwill.

This glimpse of the future is partially credited to Tony Brewer, director of the Butler Cox Foundation, a British IS research outfit. At last month's IS executive forum at Babson College in Wellesley, Mass., Brewer related a conversation with executives of Grand Metropolitan PLC, the UK firm that acquired Pillsbury.

According to Brewer, the Grand Metropolitan folks said that IS "was not an issue at all" in their decision to go after Pillsbury or in how much to pay for it. But when they later learned of such Pillsbury IS functions as the Burger King point-of-sale data collection system, according to Brewer, the British executives said knowledge of such IS assets beforehand might have influenced the valuation of their tender offer.

Brewer's story immediately got this observer's mind going. The Gordon Gekkos of the corporate raider world, armed with their spreadsheets, laptop computers and cellular phones, certainly like to use information technology for *their* competitive advantage. Along with their formulas for breakup values, debt-to-equity ratios and junk bond financing, why don't the raiders look at the IS function? So a scene from the screenplay for *Wall Street* might go something like this:

Gordon Gekko: OK, Bud, let me show you how the game is played. Let's take a look at Teldar Paper. (*Taps keyboard of laptop computer.*)

Bud Fox: Weren't they the first in their industry to forge EDI links to suppliers?

Gekko: That's right, pal, but those bums on the Street say the stock is a dog. (*Taps more keys.*) Hey, here we go. Reorganized their entire IS function in '87, put their CIO on the executive committee and piloted a just-in-time system for their corrugated box division. This thing could be worth a fortune! (*Lights a cigar.*) I say we bid 32 and let 'em squirm.

Fox: I like your style, Mr. Gekko. But what about Bluestar Airlines?

Gekko: Where have you been, kid, on the moon? They just corrupted half their customer information files trying to consolidate data centers with that commuter airline they bought. The VP of IS is gone, you hear me — gonzo! I sold short at 18. That's what those turkeys over at the SEC like to call "inside information." Makes the world go round, pal.

Far-fetched? OK, sure. But if the IS function can gain the respect and value of the business mainstream that most IS executives feel it deserves, it may someday have to withstand the same pressures as the more traditional measures of asset value. And there's nothing wrong with that.

Wilder is *Computerworld*'s senior editor, management.

Chism Mackie

CONTINUED FROM PAGE 49

yours? You come home late and you're tired,' " she says. At the same time, though, her children are proud of her accomplishments, she says.

Chism Mackie is also proud of what she has done at Transco, because she has been part of the massive systems changes. Slocum says the new systems are already affecting the way Transco carries out its business, and Chism Mackie gets a lot of the credit.

"There were times when it was tough — particularly struggling through the last several years to not spend a lot of money and to cut costs" as the oil and gas industries faced depressed prices, Slocum says. "But we stayed with it, thanks to Susie's never letting it let go."

Chism Mackie is still holding on and keeps looking to the future. "She is the visionary in the department — she sees things when other people are not grasping them," Haltom says.

In April, Transco acquired Texas Gas and added another 50% to its pipeline capacities — from 3.1 billion cubic feet per day to close to 4.8 billion. That will bring new challenges, Chism Mackie says, because while Transco is an IBM shop, Texas Gas has a Digital Equipment Corp. Vaxcluster environment.

Chism Mackie lists communication with her fellow workers as a top day-to-day priority. She claims the annual turnover rate within Transco's 180-member systems group is only 5%. Another important aspect of Transco's computing environment is its centralized nature, Chism Mackie says. "We have a lot of pressure to push control out into the hands of the operating people," she says, but her group has also been under strict financial controls. "You can't decentralize and do cost controls at the same time."

Centralization allows her to move employees where they are needed. However, the company operates its systems on a demand-driven environment, whereby the operating head of any area decides how much money is spent on systems. "We don't have an executive steering committee that sets priorities," she says.

With 20 years to go in her career, Chism Mackie knows she does not want to spend them all in the systems area. "I don't see any doors closed," she says.

A decade later

When Susan Chism Mackie came to Transco 10 years ago as a senior programmer analyst, she became involved early in the company's far-reaching systems plan.

The mammoth 10-year plan, the final pieces of which are now near completion under her guidance, includes interdepartmental and intercontinental communications and a transit system that tracks the company's pipeline capacities and all the natural gas and oil shipped through them.

Other features are data conversion and an electronic data interchange program that allows customers to order gas shipments, sign contracts and have them printed out in their own offices, Chism Mackie says.

To tackle the project, a team of 12 people representing each of the company's departments was assembled. "We took them out of their offices and away from their telephones for a year" to help design the system, she says. "You can imagine the kicking and screaming from the No. 1 person to give up No. 2 for a year."

Parts of the system revealed to date are attractive enough to raise eyebrows at other companies in the energy field, says George Slocum, Transco's chief executive officer. "We have several companies interested in acquiring our systems and customizing them to their own applications," he says.

Such an opportunity, he says, will help Transco pay off its systems expenses through selling them outright or by getting royalty revenues for their use. That's all gravy on top of cost savings and efficiencies brought about by the systems.

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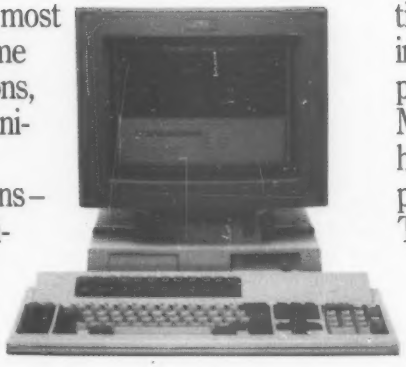

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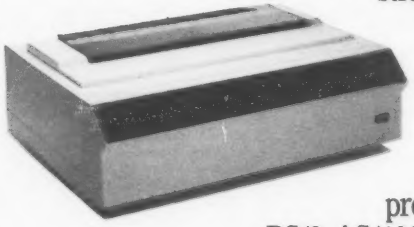

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CALENDAR

Systems executives from Rockwell International Corp., General Foods Corp. and The Coca-Cola Co. will be among the speakers at the upcoming Cost Containment & Enhanced Performance seminar. The program is scheduled for June 19-20 in New York.

Topics include building the best information systems structure for a cost-conscious firm and boosting systems productivity while coping with downsizing. For more information, contact the Institute for International Research, Information Technology Division, 331 Madison Ave., 6th Floor, New York, N.Y. 10017.

JUNE 11-17

MACIS — Managing Apple Computers in Information Systems. Chicago, June 11-13 — Contact: Mary Jo Rasmussen, MACIS, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Expert Communication '89. San Francisco, June 11-14 — Contact: Graphic Communications Association, Suite 604, 1730 N. Lynn St., Arlington, Va. 22209-2085.

National Prime Users Group Conference. Anaheim, Calif., June 11-16 — Contact: NPUG, P.O. Box 697, Laurel, Md. 20707.

CICS: Managing Availability and Performance. St. Louis, June 12-14 — Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

Computer Graphics for Design. New York, June 12-14 — Contact: The Center for Computer Graphics for Design, 45 Stephenson Terrace, Briarcliff Manor, N.Y. 10510.

International Trade and Computerization Conference and Exhibition. Washington, D.C., June 12-14 — Contact: Eugene A. Hemley, Executive Director, NCITD, Suite 205, 350 Broadway, New York, N.Y. 10013.

Personal Computer Conference. Toronto, June 13 — Contact: International Data Corp. Canada, Suite 1000, 7 King Street E., Toronto, Ontario, Canada M5C 1A2.

User's Role in Software Development Course. Chicago, June 13-14 — Contact: Applied Information Development, 823 Commerce Drive, Oak Brook, Ill. 60521-1919.

Visudo '89 Conference and Exhibition on Visual Computing for Defense, Government and Large Projects. Paris, June 13-16 — Contact: E.S. International Communications, 16 Avenue Bugeaud, 75116 Paris, France.

Metaphor Data Interpretation System Users' Meeting. Berkeley, Calif., June 14-16 — Contact: Metaphor Computer Systems, 1965 Charleston Road, Mountain View, Calif. 94043.

National Association of Telecommunications Dealers' Meeting. Boston, June 14-17 — Contact: NATD, 1255 23rd St., N.W., Washington, D.C. 20037.

Seminars on "New Directions in International Telecommunications" and "Telecommunications: Deregulation and Regulation." Arlington, Va., June 14-15 — Contact: The Telecommunications Conference Center, 1133 Broadway, New York, N.Y. 10010.

North American ISDN Users' Forum. Boston, June 14-16 — Contact: Kim Brashears, U.S., Department of Commerce's National Institute of Standards and Technology, Gaithersburg, Md. 20899.

Computer-Aided Engineering conference. Washington, D.C., June 15-16 — Contact: Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

ESA Overview: National Capitol-Area MVS User Group Kickoff meeting. Fairfax, Va., June 15 — Contact: George Mason University, University Entrepreneur Center, Suite A6, 4260 Chain Bridge Rd., Fairfax, Va. 22030.

OS/2: Inside and Out seminar. Boston, June 15-16 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

JUNE 18-24

International Conference on Design for Manufacturability. San Francisco, June 18-20 — Contact: CAD/CIM Alert, 824 Boylston Street, Chestnut Hill, Mass. 02167.

Corporate Venturing Conference. Boston, June 19-20 — Contact: Venture Economics, P.O. Box 81348, 16 Laurel Ave, Wellesley Hills, Mass. 02181.

SCIENCE/SCOPE®

An innovative combination of thermal, radar, laser, and video sensors may accurately identify military targets on the battlefield. The combination, successfully demonstrated by Hughes Aircraft Company in a joint venture with Texas Instruments, is called multi-sensor fusion. During operation, a computer combines digital terrain map information with data from a single package containing a thermal imager, radar system, laser rangefinder, and video camera to produce a "fused" target list. This process improves the probability of target identification and reduces the possibility of false identifications. The multiple sensor approach has applications in helicopter, fighter and tank operations.

Television programming will be available with picture quality similar to 35 millimeter motion picture film and sound quality similar to a compact disc. Hughes and North American Philips are working together to test a high definition television (HDTV) system for satellite delivery of HDTV to American homes. Research will include a mobile HDTV Viewing Center to advance research of the new technology and conduct engineering and picture-quality rating tests. Two Direct Broadcast Satellites will be launched by Hughes in the early 1990s to beam a total of 32 channels of television programming direct to one-foot home satellite antennas throughout the United States.

New primers help protect electronic circuits in neural prosthesis devices. The primers, plasma polymerized hydrocarbon films developed by Hughes, are used to bond biologically inert protective coatings to the devices for periods of over 10 years. The prosthesis devices help victims of neural trauma, such as stroke, to regain some of their lost neural functions by electrically stimulating proper areas of the brain. Plasma polymerized films are also useful as protective coating in many other applications such as infrared optics that are exposed to extreme conditions of sand and salt water.

A small, low-power oscillator uses a microprocessor for improved temperature compensation. The Microprocessor-Controlled Crystal Oscillator (MCXO) developed by Hughes occupies 1.5 cubic inches, and typically consumes less than 75 millowatts, and offers a stability of ± 0.4 parts per million over the full military temperature range. The MCXO achieves its combination of stability and size by employing a microprocessor to digitally compensate the oscillator frequency over temperature. This digital compensation provides increased performance and stability compared to analog frequency compensation techniques currently in use.

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HUGHES

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Sounds good, but what does it really mean?

BY KATIE CRANE

Work group computing is a phrase in search of meaning. Try to talk about it, and questions follow questions.

"Tell me how you define work group computing, and I'll tell you if we're doing it," says Frank Gordon, a programmer/analyst at the Texas State Board of Insurance in Austin.

Gordon is hedging a bit. In truth, he is pretty certain that what his organization is doing does not fit any of the possible definitions of work group computing. The board is currently connecting a network of workstations to what he calls an "optical jukebox" so that clerical workers can have immediate and simultaneous access to the optical equivalent of 300 square feet of files.

But Gordon, who is the project manager responsible for implementing the image processing system, says that if intentions count, then what his group is doing might qualify.

"We have insisted on a platform that could easily be converted for interagency activity," he explains. That platform, he claims, is something that could truly be called be work group computing.

Gordon's guess is just as good as any other because no one is absolutely sure of what work group computing is. Is it, as one industry analyst calls it, "a swarm of buzzwords around the bright flower of an idea," or is it, as one vendor claims, "the dynamic glue that holds groups of workers together, coordinating their efforts as they work toward some common goal"?

Scott Beck, vice-president of information systems at Healthcare Compare Corp. in Lombard, Ill., says he wishes he knew the answer. "We give individuals the ability to share information and do different things simultaneously," he says, but the organization never uses computers to hammer out a consensus or as part of any committee process. "Is that work group computing?" he asks.

If you happen to be using one of today's broader definitions of work group computing, it probably is. One of the broadest interpretations is simply this: users with common interests and needs sharing computer resources. Healthcare Compare more than meets that criterion.

The company operates a network with 37 file servers and 700 nodes supporting eight departments. It uses that network to prepare proposals as a team. Last year, three people completed 250 proposals by submitting different sections (and some boilerplates) then merging the components to comply with each request for proposal. In addition, the production, quality assurance, marketing and sales departments frequently collaborate on reports initiated by one department and supplemented by each of the others.

"I guess you would say we sort of do [work group computing]," Beck tentatively concludes.

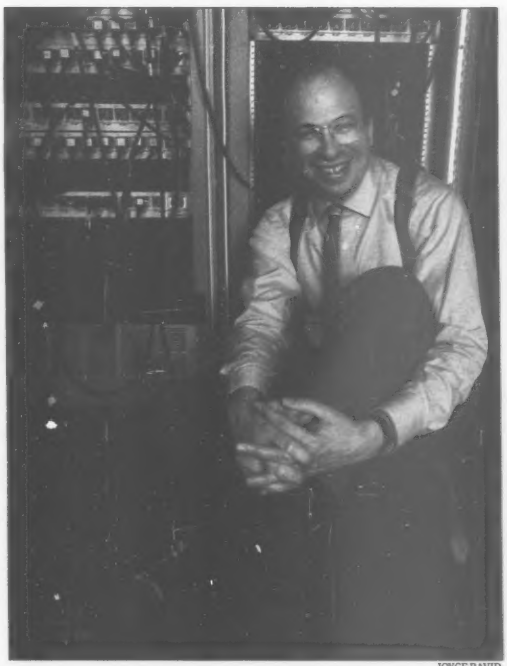
At Otis Elevator, Inc. in Farmington, Conn., Vice-President of Finance Jean Mordo is much more certain about what work group computing is. Although comprehensive work group computing will not be a reality until local-area networks in Otis' Singapore and Paris offices are completed and the software for group interaction is bought, the firm envisions international message swapping and electronic conferencing.

Mordo reports that installing a LAN in the company's headquarters office was the first step. Now, Otis is planning to install some commercially available groupware products. He says, however, that the real potential of work group computing will not be realized until the Singapore and Paris LANs are on-line. "Then," he predicts, "we'll do some exciting things."

It is somewhat symptomatic of the concept's current state of development that business executives such as Mordo picture the possibilities of work group computing more vividly than the IS executives responsible for executing the details.

The visionaries and the vendors paint tantalizing scenarios of what work group computing can provide. For example, they say, writers from several locations around the globe can co-author a paper by zipping files back and forth electronically. Engineers can use sophisticated groupware tools to design new products. Sales representatives and marketing analysts can share common databases for different, but complementary, tasks. People, whether separated by corridors or continents, can meet together using their electronic calendars to schedule a brainstorming session, then come away with electronic minutes of the event.

After all these promises comes the voice of reality, which almost always belongs to an IS executive. In this case, the voice belongs to Stephen Morse. Morse, who calls himself a project architect at Manufacturers



JOYCE RAVID

Manufacturers Hanover's *Morse is working to tie the bank's applications around a common work group architecture*

Crane is a free-lance writer based in White River Junction, Vt.

INSIDE

What kind of animal is groupware?
Page 64

Why groups stick with plain E-mail
Page 73

WE CAN TAKE SOMETHING THIS COMPLICATED,

O'Hare Industries Memorandum

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To: Alfred
Re: Tucson Office

Alfred:

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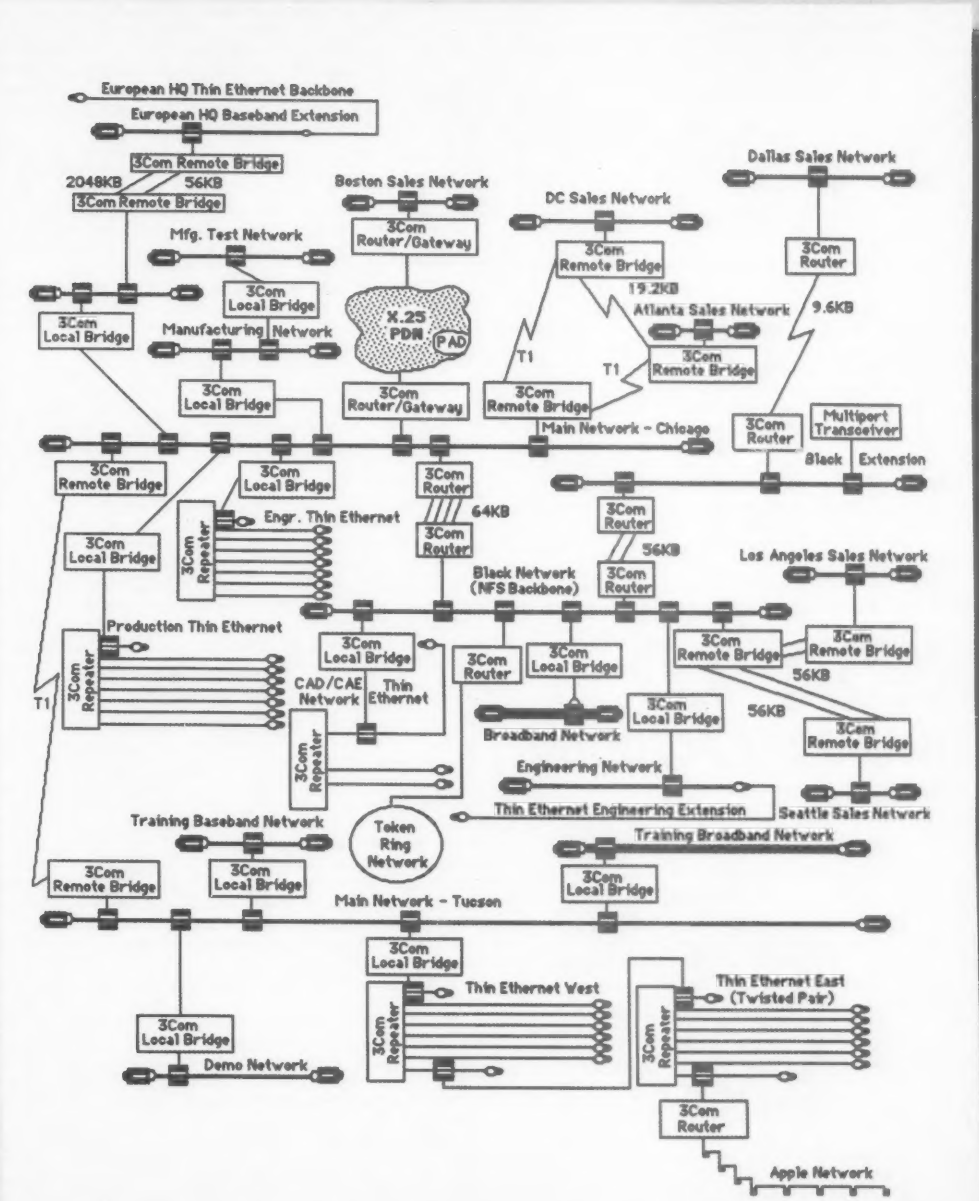

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Sounds good

CONTINUED FROM PAGE 57

Hanover Bank in New York, says he prefers to put in his two cents "after the dreamers have made their speculative statements."

To hear Morse tell it, Manufacturers Hanover is probably on the cutting edge with respect to work group computing. The bank has built many shared applications on the basic philosophy that information must be exchanged easily.

For nine years, nearly 8,000 of its employees have been on a central electronic mail system. The firm also operates regional E-mail systems and is currently linking its discrete LANS to create a large, dynamic network system that will act as "a single large data engine."

The ultimate goal, Morse says, is to create a structure that will permit an authorized person anywhere in the bank to share information with another person. "We are trying to build our entire architecture around this technology so we can integrate all these things," he explains.

Is it happening? Yes, Morse says, but not always as quickly or as easily as he would like. "We work with the practical realities every day," he explains. "We're the ones who have to troubleshoot the problems."

But Morse is not discouraged. "It's working — not always the way we'd like, but it's an evolutionary process," he says.

One of the collaborative systems that the bank does have in place is a networked database system for customer tracking and prospect development. That system is used by account officers and support personnel to coordinate sales and account service efforts and to make sure that all personnel are fully versed in a customer's interests and activities.

"Different levels of people will call on people in our customer organizations," Morse explains. "We have to coordinate those calls — make it clear who has been calling whom and what they have promised." Having a system that can be dynamically updated is imperative, he adds, because if a bank officer meeting with a customer does not have current data at his fingertips, "We're not helping them."

Although Morse has looked at a personal information manager he thought might function as groupware, he has not yet invested in any product. As it turned out, he says, the product he tried could not handle a large group on a network.

Like Morse, many IS managers who have invested considerable time and effort in facilitating computer support of collaborative work have done so without the benefit of the class of products that are now springing up around the concept. Most do make some use of E-mail, but there is considerable debate whether E-mail qualifies as bona fide groupware.

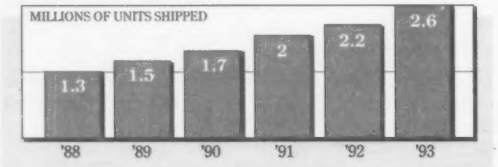
Groupware, it should be understood, is a much newer and even less clearly defined concept than group work. If people get mired in definitional problems when discussing what work group computing is, they positively bog down when talk turns to the software products that promise to support this endeavor.

At the core of the confusion is the question of whether the label applies to any electronic tools that permit dynamic access or whether it requires that something be added to the equation — that shared information somehow be enhanced.

However, there is a much larger matter at hand than groupware's definition. That is, how much will groupware add to or subtract from the already formidable technical task IS managers face in trying to support work group computing?

Users like company

Demand for multiuser applications is on the rise, with shipments expected to double between 1988 and 1993



SOURCE: MARKET INTELLIGENCE RESEARCH CO. CW CHART: FRANK C. O'CONNELL

Trade-offs

Esther Dyson, editor and publisher at Edventure Holdings in New York, suggests that the "ideal [groupware] tool does all the work but gives the user total control." Admitting that she has seen no such tool yet, she says the best groupware product will "handle the routine stuff and thereby free people to exercise individual initiative and flexibility." But, she asks, "How much flexibility must users trade for this power?" Ay, there's the rub.

Sloan's *Malone predicts customized groupware*

Users, especially executives, are not willing to trade much flexibility. Consultant Phil Gilbert, founder of Gilbert & Associates in Pacific Palisades, Calif., says groupware tools will work only if they make it easier to do group tasks quicker, better or more intuitively than before. "They won't work," he warns, "if you ask people to change their style."

Virtually everyone, including developers and enthusiastic users, agrees that currently available groupware products fall short of ideal flexibility.

So who will construct this flexibility? The vendor? The users? The IS staff?

Lotus Development Corp.'s Irene Greif claims it is the vendor's job. Formerly with MIT's Office Automation Group and currently senior development manager of advanced technologies at Lotus, Greif oversees the development of a groupware product called Lotus Notes. Good defaults are the key to flexible groupware products, she explains, and any software that hopes to be accepted should inherently include this capability.

For example, multiple work groups may exist with the same people playing different roles in each group. Thus, in a co-authorship arrangement in which there are writers, editors, commentors and general readers, each group might want to assign particular roles to specific people in the group or modify the roles. "That should be easy to do by changing defaults," Greif says, "not by having to define something new."

MIT Professor Thomas Malone says he thinks users can customize groupware products to their own liking, but only if there are easy-to-use fourth-generation language and artificial intelligence components included. Malone heads a team at the Sloan School of Management that has developed a prototype groupware product that uses "little intelligent agents that act on your behalf." The user tells the intelligent agents to sort and prioritize incoming mail, filter out unwanted mail or scan public information for items of interest.

J. Roger Moody, president and chief executive officer at Coordination Technology, Inc. (CTI), which is developing application-building groupware based on OS/2, says he does not believe that any vendor can write a groupware application. He argues that putting prepackaged, shrink-wrapped groupware on the shelf would reduce the complex needs of people working in groups to the lowest common denominator.

IS managers trying to turn visions of work group computing into reality face much more challenging tasks than assembling the building blocks of groupware, however. Laurence Rosenberg, director of the Information Technology and Organizations Program at the National Science Foundation in Washington, D.C., has encouraged and funded a lot of research into the group dynamics that make or break groupware and group work. He says there is still much to be done, both in terms of technologies and in understanding how decisions are made.

Potential users and experts worry that automating group work can lead to the worst kind of committee results: excessive caution and watered-down decisions.

That fear is not a problem at the University of Arizona in Tucson, which has used its electronic meeting facilities several hundred times for such tasks as electronic brainstorming, issues analysis, prioritization and decision making.

Doug Vogel, working with others at the university, has developed more than a dozen software tools for use in the sophisticated planning and problem-solving sessions. Vogel, a researcher and professor of MIS at the university's College of Business and Public Administration, notes that the participants' experiences have been extremely and consistently productive.

"People are accomplishing in a half day or less what would normally take a full day or longer," he reports. Better still, he adds, is the "super group dynamics" that develops out of this environment. (See story, page 74.)

Bad shortcuts

But James Matheson, whose Menlo Park, Calif., consultancy, Strategic Decisions Group, has developed something called the Meeting Productivity System, is more wary of the consequences of group thinking. He claims it is easy for groups to be lively and interactive but much harder to get the group to make a rational decision along the way.

Matheson says he worries when he

hears comments like, "We made this big decision in only four hours," because he is concerned that, in some cases, the decision might have merited four months of study.

Matheson warns users not to let electronic tools become an excuse for not making informed decisions. When groups use work group computing to take a shortcut, he fears they could be doing more harm than good. "Don't sacrifice decision quality," he tells potential users.

Like Matheson, Lawrence de Bivort, director of the Evolutionary Services Institute, a consultancy based in Bethesda, Md., warns that much may be lost in the name of a good cause. If vendors create systems that look good but constrain people, he says, they may inhibit "the magic that comes when people interact with one another in an open environment." Fortunately, he adds, "People will sabotage such systems."

John Seely Brown, vice-president of advanced research at Xerox's Palo Alto Research Center (PARC), refers to the quest for spontaneity in work group systems as "the coffee pot challenge."

For several years, his work has focused on exploring how small groups of people (which often assemble around office coffee pots) mingle their perspectives to construct a brand-new way of looking at things. Recently, he has begun to muse on how to capture informality — the creative swapping of information — when working electronically with colleagues located 1,000 miles away.

Toward that end, Brown and Mark Stefik, one of the visionaries behind PARC's famous Co-Lab project, have written a paper exploring long-distance brainstorming, which they call "Portable Ideas."

There is little question that work group computing in its ultimate form will create vast changes in the power structure and organizational charts of the companies in which it takes hold.

Ad-hocracies

MIT's Malone predicts that innovative or adaptive organizations, for example, will employ information technology for more lateral networking to support decentralized and geographically shifting teams. He also suggests that there will be more ad hoc organizational structures, or "ad-hocracies," formed, which will require more communications "up, down and across in every direction."

Some pessimists say that the prospect of this kind of rampant information exchange will seem threatening to many IS executives. They predict that these executives will resist work group computing as they did personal computers because they fear losing control with something so unstructured.

In fact, that fear is not unfounded. Group work produces complex relationships among people, data and schedules — relationships that introduce a host of thorny questions relating to overall management, access control and security.

Lotus' Greif says she can imagine a scenario in which user demand for groupware products that suit their varying — and sometimes conflicting — styles could become a major burden. While she is sympathetic to the hardship this may cause, she urges IS managers to establish guidelines and find ways of dealing with this diversity. "Dealing with conflicting requests," she says, "is what any service organization has to do."

Although many are confused and uncertain about their next step, Malone says he has encountered few IS managers who are resistant to the idea of implementing work group computing.

PARC's Brown *sees hope for group spontaneity*

John Moore, MIS director at General Food Bakery Co. in Bayshore, N.Y., and an enthusiastic proponent of work group computing, says he can explain that mystery.

"In the fresh-baked business," he explains, "we have to put the right product in the right store on the right shelf on the right day," noting that his company is much better able to do that because it uses Metaphor Computer Systems, Inc. workstations and software to expedite the consolidation and analysis of U.S. shelf and sales statistics.

The reason that many organizations and IS managers are willing to suffer through the confusion and hardships associated with creating the structure to support work group computing is that they, like Moore, "want the right information available to the right people at the right time in order to understand the business and move it forward."

Rich Castor of Smith, Kline & French Laboratories, a pharmaceutical company in Philadelphia, is one voice of perseverance. Like Gordon, Beck and Mordo, Castor hesitates to call what his company does "work group computing." Many parts of the infrastructure are in place, he says. The company has installed the LAN part of its strategic platform, has E-mail and electronic calendars in place and is moving to electronic information management.

All of that, however, is just the starting point in the move toward work group computing. "We're just at the beginning," he says. "Ask me the same question in 10 months, and I'll tell you a different story." •

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Drawing the groupware lines

BY J. C. KIMBROUGH

Defining groupware is a snap. Just picture the body of a horse with an elephant's head, a lion's tail and an eagle's claws. In other words, it is an unmatched assortment of products being called the same animal. That is partly because the market is still in its formative stages and partly because it is hard to get a consensus on what categories exist, if any, and how the lines between them are drawn.

Some experts are using a broad brush to paint the groupware picture. For instance, John Seely Brown, vice-president of group work research at Xerox Corp.'s Palo Alto Research Center, calls the facsimile machine a piece of groupware. "It gives ultra-high bandwidth communications," Brown says, "and is a highly efficient, low-overhead, collaborative tool."

Julian Horwich, executive director of the Chicago Association for Microcomputing Professionals, agrees with the liberal approach. He includes basic electronic mail as a groupware tool but describes groupware as "a vague term that applies to almost anything we do on machines, which could include mainframes." Nevertheless, he says, "Groupware will be one of the hottest buzzwords in computing in the next few years."

Out of the gray

Certain types of products do seem to register with everyone as a definite part of this gray area. One such category is document-editing or collaborative authoring tools, such as Broderbund Software's For Comment, which runs on IBM microcomputers, or Network Technologies International, Inc.'s Unix-based Docuforum.

In the Apple Computer, Inc. Macintosh world, Mark-up from Mainstay or the soon-to-be-released Annotater from Farallon Computing, Inc. offer document editing software. These products let members of a group offer opinions about an article or report without tampering with the author's original version.

Form-centered or form management software for transaction processing is another possible division of groupware. For instance, groups responsible for approving loan applications can use products like Motorola, Inc.'s Life to electronically pass forms to the appropriate people as action is required.

ELECTRONIC messaging systems that are several steps beyond E-mail in sophistication make up one of the most well-defined areas of groupware.

Work group communication managers, electronic messaging systems that are several steps beyond E-mail in sophistication, make up one of the most well-defined areas of groupware. So far, there appear to be more contenders in this roughly bounded category than any other. Depending on the specific program, these products include such features as teleconferencing or computer conferencing, calendaring, scheduling and data management capabilities.

Some of the products in this category are Office Works by Data Access Corp., Coordinator by Action Technologies, Inc., VAX Notes by Digital Equipment Corp. and Higgins by Enable Software, Inc. Lotus Development Corp.'s Notes, which is expected out by the end of 1989, is aimed at broadening the current concept of communication management programs even further, by incorporating aspects of information management.

"One of the things people

Continued on page 68

Kimbrough is a free-lance writer based in Los Angeles.

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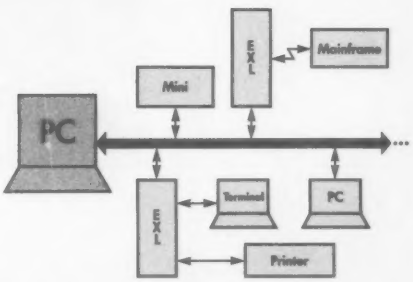

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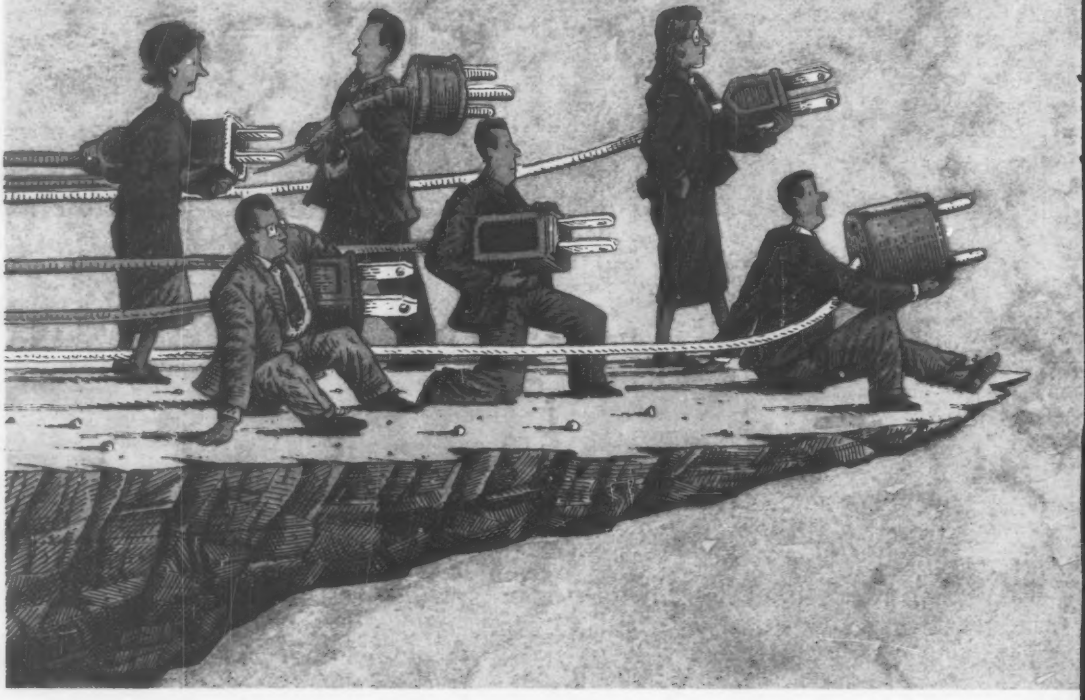

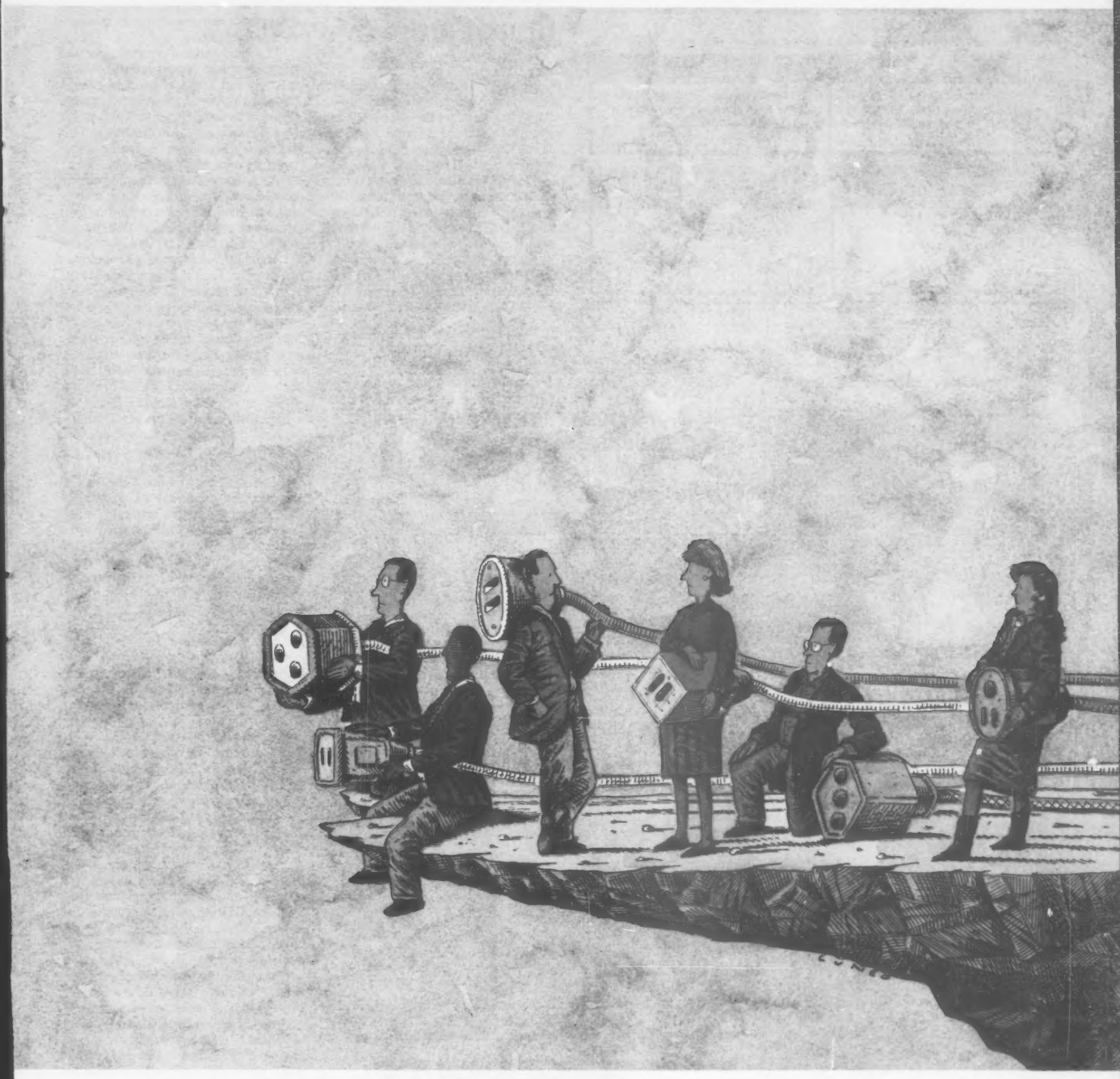

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Groupware

CONTINUED FROM PAGE 64

worry about is having too much information," says Donna Simonides, product marketing manager for Notes. "I may send you 30 pieces of E-mail. Some may be more critical than others, and you need help prioritizing them."

The hitch in selecting among communication managers is that while these products have some similarities, they also have their differences. No two are enough alike to go head-to-head in the marketplace the way that Borland International's Quattro competes against Lotus' 1-2-3, or Wordperfect Corp.'s Wordperfect vies with Microsoft Corp.'s Microsoft Word. Users must decide which product meets their specific needs.

The same problem crops up in project tracking/project management, another category that some people include under the general title of groupware. Susanna Opper of Susanna Opper & Associates, a New York-based consultant specializing in groupware, makes a big distinction between tracking and management.

When a major engineering firm uses hundreds of people to build a multimillion-dollar building, it needs a complex project management system, Opper says. When a start-up company is developing a time line for bringing its first product to market, it needs a project tracker. Opper says, "Project management is for the big guys, and project tracking is for the little guys."

Opper also sees fascinating potential in another category of emerging software, team development programs, which deal with the process of group work rather than the content. She points to programs under development that are being designed to help managers create groups, analyze the group's needs and behavior and give managers pertinent data they can feed back to the group.

"In the next evolution, this kind of software will be available to groups to help themselves," she predicts. "When computers begin to become part of the group and perform a function for the group, it's exciting. Calendaring, even if you can figure out how to do it, is not exciting. It saves the secretary some time, but that's about it," she says.

Combo programs

Ultimately, groups will probably need some combination of the various programs to get the job done. Because the concept of groupware is still evolving, what looks like individual categories probably will not stay that way.

"If anything, the categories are going to blur," says Professor Thomas Malone of MIT's Sloan School of Management. "Eventually, groupware will include all categories." Malone and his teammates at MIT are working on Information Lens, a way of using artificial intelligence to manage information sharing, and on Object Lens, a general-purpose umbrella for cooperative work and information management. Malone predicts commercial products based on their research will be on the market in two to three years, maybe even sooner.

Meanwhile, software developers are already realizing a bigger iceberg is under all the seemingly separate tips.

A recent announcement from IBM and Metaphor Computer Systems, Inc. means Metaphor's information-sharing and decision-support software will now run on high-end IBM Personal System/2s, Personal Computer XTs and ATs instead of only on Metaphor workstations.

By March 1990, Coordination Technology, Inc. will probably offer an as-yet-unnamed product that company President Roger Moody describes as something that is not a specific application such as Lotus Notes or Higgins but "a work development environment."

If the implications of all of these programs are difficult to grasp right now, it may be because they are dealing with concepts so abstract they border on the metaphysical. It is easier to describe them in terms of the known things that they are not than the unfamiliar things that they are. Experiencing them may be the only way to make them concrete. ●

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THE COMPETITIVE EDGE

US West shrinks the distance

BY JANET FIDERIO

Management-by-walking-around isn't a possibility at US West, the Denver-based regional holding company. US West has 65,000 employees in a 14-state area, and often a manager will supervise people scattered from Denver to Seattle.

This system of long-distance affiliations came about because US West was formed from the consolidation of three former Bell operating companies that serviced 7% of the U.S. population and covered 40% of the country. After the consolidation, it was decided that distributed work groups offered the best means to integrate employees with parallel functions while avoiding relocation hassles.

According to Steve Dickson, information resources analyst at US West's Information Technology Services Group and manager of the Information Resources Microcomputer Network Project, the company has attempted to keep the lines for work group communication and collaboration open in a number of ways. The most all-encompassing task, Dickson says, was the development of Message Net, the company's proprietary wide-area mail/transport system.

Message Net, which has been running for almost two years, routes messages and documents from users of the firm's Wang Laboratories, Inc., IBM, Digital Equipment Corp. and Apple Computer, Inc. computers. With Message Net, US West employees have access to approximately 30,000 mailboxes and at least some type of office automation system.

Message Net provides a compound message format definition as well as various transport mechanisms to move messages and files among various systems. This means that if one isolated member of a work group uses a Wang system, he can still communicate electronically with the other members of his work group using a DEC, IBM or any other US West system.

Being able to exchange files electronically has stimulated collaboration, Dickson says. So have amenities such as the ability to post agendas and transmit working documents for conference-call meetings. "It often happens with conference calls that somebody will be on-line, but they won't have the documents being discussed," he notes. "If you can rush them over Message Net, rather than have them faxed, it's a step in the right direction."

The company's 2,000 IBM PC and compatible system users can augment Message Net's services with a commercial groupware product called Higgins from Enable Software, Inc. Higgins, which can operate on US West's 200 Novell, Inc. networks, is currently used by about 1,100 employees, Dickson reports. In addition to electronic mail and document transport, Higgins provides document management, group scheduling, the ability to create shareable work group files and bells and whistles such as electronic clocks, to-do lists and appointment logs.

One of Higgins' more important value-added components is security, Dickson says. If a work group member knows another member's public password, then that person is entitled to see their public entries, whether it is mail, files, logs or directory information. "But if something is flagged 'private,' " he explains, "it's private." When either public or private information is read by another person, Higgins notifies the home system.

> SYSTEMS SUCH as Message Net can help level the playing field for employees far from their manager or the center of action.

Dickson, whose work group uses Higgins, finds it useful to overlay and compare the schedules of work group members. "It's very convenient for work groups to be able to [check schedules quickly]," he says. "In our type of support organization, we have a lot of project meetings, and people are not always at their desk. It's easy to find out where people are if they keep their electronic appointment calendar up-to-date."

Because Higgins operates as a node on the larger Message Net System, it is possible to send messages and documents seamlessly from Higgins to one of the other office automation systems.

Having a system like Message Net as the foundation of its work group communications means US West does not have to rely on Higgins-to-Higgins connections or other proprietary system requirements. The disadvantage of using Message Net as a connection medium is that some functions may be lost (for example, classification flags such as "private" and "urgent" in a Higgins network).

Systems such as Message Net can help level the playing field for employees far from their manager or the center of action, Dickson says. But having the technology in place is only half the battle. For collaborative systems to work, he adds, you need group support and group participation: "It's like the inverse of the law of diminishing returns. As you add people, you get more and more returns." ●

Fiderio is a Gilsum, N.H.-based free-lance writer.

INTERVIEW

Getting a picture of the group

When you talk to companies pursuing work group computing, a puzzling fact emerges. While electronic mail is a popular tool, other groupware products are seldom being used.

Christine Bullen is no stranger to electronic collaboration — she lives in Hastings on Hudson, N.Y., and works in Cambridge, Mass., as the assistant director of the Center for Information Systems Research (CISR) at MIT's Sloan School of Management. In fact, for her latest project — an investigation of how work groups make use of electronic tools — Bullen collaborated with West Coast-based John Bennett of the User Interface Institute at IBM Research, whom she calls "the perfect electronic collaborator."

After one year of examining work groups that had access to electronic tools, Bullen says she and Bennett have turned up as many questions as answers. She says one of the most puzzling questions is why, although electronic mail is very popular, other kinds of groupware tools are barely used.

Bullen is not ready to write off the category. But, after following several groupware products for as long as three years, she has not been able to find evidence that their use has resulted in any significant changes in the way people work together.

Bullen spoke recently with free-lance writer Katie Crane about her current research and shared some preliminary observations.

Is your current research an attempt to document how groups use groupware tools in the real world?

Yes, but perhaps even more important, it is an attempt to answer some basic questions. We've completed case studies in 11 companies [including 25 sites and more than 100 interviews] to find out how groups work together, what the most important factors are in that work, what electronic tools they use and, of those tools, which are useful and which are not.

What have you found out about group work?

One of the most interesting questions is, what is a group? A "group" used to be defined as an organizational entity, a department, for example. But now, with electronic links, the definition is not so clear; groups come and go quickly, and they cross departments and locations. For most large companies today, the boundaries and sizes of different groups vary and sometimes go beyond the company to include customers, suppliers, industry groups, even competitors.

Every organization you studied had access to electronic groupware tools. Which are they using?

One of the most interesting things we found is that people aren't always using these tools. The fact that the functionality exists does not mean that people are using it.

During this past year, we looked at firms that use quite a range of tool types, ranging from large systems like Digital Equipment Corp.'s All-In-1 and IBM's Professional Office System to personal computer local-area network-based systems like [Enable Software, Inc.'s] Higgins and [Action Technologies, Inc.'s] Coordinator. We also looked at companies using [Metaphor Computer Systems, Inc.'s] Metaphor, which is marketed as a niche product but may have more general application, and [Broderbund Software's] For Comment, a single-function tool for group writing projects.

In addition, we studied a variety of what I call "administrative" products that offer such things as E-mail, computer conferencing, filing, address books and expense tracking and sometimes even spreadsheets. In reality, people are barely exploiting the functionality of these tools with the exception of E-mail.

Can you say why E-mail is so popular?

Communications is where the easy value is. Even for the products with awkward interfaces — and there are some — the communications aspect is always the most popular.

We still don't know whether that means communications is really all that's necessary for groups to interact and work together and other funtionalities are merely icing on the cake. It may also be that sending messages back and forth electronically is so similar to the way we've always sent messages that it's a familiar first step.

Are people merely indifferent to groupware products, or are there things about them that they don't like?

My preliminary observation is that most groupware tools simply are not living up to the vendor's hype or the user's expectations. Again, that raises some questions. I'm not sure, for instance, whether the problems are mostly related to function or ease of use.

Electronic calendars are a good example. Not many people like them. What we don't know is why. It may be that people don't really feel they need an electronic means for keeping track of dates, or it may just be a matter of design. We write notes to ourselves, jot down telephone numbers, put colors on certain days to highlight them and draw arrows to link things. Furthermore, we like to see a week or a month at a glance. Most electronic calendars don't offer all of these features.

Christine Bullen

Can you think of other reasons why people wouldn't be using electronic groupware tools?

A third possibility is that some tools simply require too much training to be useful. Vendors aren't really picking up on that, and the organizations don't think of doing it themselves. As a result, the users despair and disregard the tool. This seems to be another case of the techies saying, "Here's a new technology that will fix things," without providing the training and support necessary to make it work.

Doesn't successful implementation also depend on how the tool is introduced?

Absolutely. For example, one company we researched had been using the identical in-house system at two different sites for more than five years. Quite by chance, it had been introduced in two entirely different ways. At Site A, it had been introduced as a significant new tool. At Site B, it had been brought in as an experiment. Today, it is an important tool that people rely on at Site A, while it is seen as an informal kind of thing, like a toy, at Site B.

This proves environmental cues are important. Too many product developers and managers expect users to see how great a product is and use it. In reality, if someone doesn't like it or doesn't use it, that message gets passed along.

Do you have any other preliminary observations from your research?

Yes, one: Users are crying for integration of these tools. For example, For Comment is a popular tool, but users complain that it is still an isolated tool. That may change [if the rumor is true that Microsoft Word may incorporate For Comment].

But it is symptomatic of a much larger problem: How easy is it to integrate these groupware tools with other electronic tools? You want it to be easy.

Rather than buying new word processing software, you should be able to incorporate the one you are using into your groupware. You should be able to push a key and go from one thing to another. Instead, you have to log off, then log on to something else — in some cases even change the connection on your workstation — just to get to work on another task. That's asking too much of the user. •

Coordinated information brings meetings to order

BY DOUGLAS VOGEL

We can't keep meeting this way, if we hope to keep up in today's business climate. Everyone complains that meetings eat up too much time, but that is really the least of the problems. A less frequently mentioned but more pernicious characteristic of meetings is the way in which they serve to dilute information.

Consider what occurs before and during a typical business meeting:

First, we gather information that might be relevant and format it in some way for discussion purposes. We take it into the meeting, along with whatever facts we can hold in our minds, leaving in our offices a vast array of potentially relevant information. In the meeting, we assemble our facts and try to integrate them into a composite, directed picture. At the end, staff members compile a final report that, because it is a summary treatment, loses much of the discussion's richness.

There is at least one means for improving this disjointed and leaky process — using computers to support the cooperative work of meetings.

Now try this

To get an idea of how this could work, imagine the following: You go into your meeting having thought about the topic but without any paperwork. Relevant data is available in the room through a variety of access channels and media drawing from sources such as on-line databases and electronically scanned text.

Some meeting participants are actually in the room; others are in similarly equipped facilities at other sites. You can share information electronically and converse face-to-face, drawing on pertinent data as needed.

As the meeting progresses, an electronic picture of the relationships among the information takes shape and, on the basis of that picture, the group moves toward agreement. At the end, each person is handed a "layered" management report showing the stages of data build-up that led to the decision.

This meeting will continue to exist in electronic form, available to this group as well as to others working in related areas. Access to this "meeting memory" will help reduce the context-building necessary in future sessions.

The kind of electronic meeting support described does, of course, demand an extremely robust data management structure. Some of the critical necessary supports include the following:

- **Seamless integration** of an organization's information support services. The goal is to be able to access information in a timely fashion regardless of how or where it is stored. This involves networked access in conjunction with corporate IS policy and standards.
- **An easy browsing and retrieval system** to incorporate relevant data in group deliberations. The system can be semantic-based with sufficient intelligence to support the needs of non-technical executives.
- **The ability to tap the knowledge of experts** for extra information without leaving the room. This can be accomplished through access to previously organized or dynamic information. It may involve electronically tying that person into the group's deliberations.
- **Incorporation of data** by any group member at any stage of the process. Structured view access ports to the data allow meaningful traversal of the information. Once information is located, it can be brought into the current session. This requires electronic meeting system software that allows integrated levels of both individual and group support.
- **Meaningful organization and presentation** of session information. This requires "hypermedia" software, which permits organization of the data without injury to the relationships and meanings attached to it. It also requires graphics manipulation capabilities and large-screen presentation hardware.
- **Summarization and tailored reporting** of session information as well as storing data for later access. This requires attention to procedures for organizing information as well as flexible software report generators that can be easily modified to meet users' varying reporting requirements.
- **Systems and procedures to ensure** that security and data credibility is sustained. Failure to effectively manage sensitive data undermines any chance for a successful application.

This kind of efficiency does not come without a price, but neither does our current method of managing data in support of group decision making. Computer support of the meeting process presents tremendous opportunities.

As the pace of business and the tenor of competition heats up in the next few years, there are likely to be more instances in which meetings demand the participation of personnel in remote locations and more meetings clamoring for limited time and attention. •

Vogel is an assistant professor of MIS at the University of Arizona in Tucson.

CD-ROM enters mainstream IS

Try in-house publishing as initial application for maturing technology

BY DOUG ILES

When compact disk/read-only memory (CD-ROM) technology made its official U.S. debut at the National Computer Conference in 1985, it was touted as an industry breakthrough — a revolutionary technology. Like most new technologies, it was immediately saddled with extremely high expectations.

Now, four years later, CD-ROM has matured into a viable technology, one that is starting to meet some of that early acclaim. For example, Lotus Development Corp. has placed financial information on CD-ROM. Microsoft Corp. offers various reference manuals as a CD-ROM product, and Dialog Information Services, Inc. has migrated several of its on-line databases to CD-ROM.

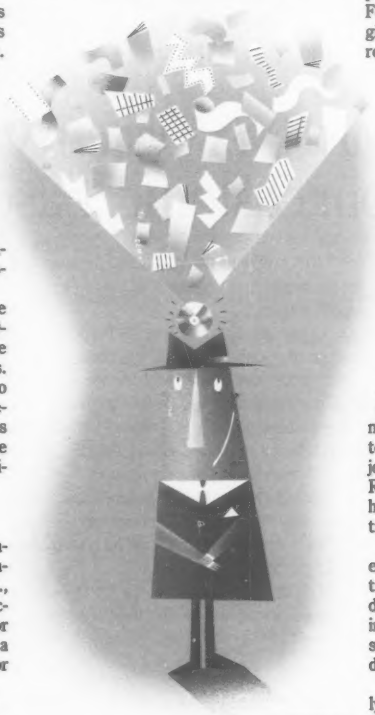
In each of the above-mentioned cases, the application of CD-ROM has resulted in a commercial product that is intended to generate revenues. But should information systems professionals care about CD-ROM?

Yes. While CD-ROM products garner the headlines, there is a groundswell of CD-ROM activity behind the scenes at Fortune 1,000 companies and government agencies. These organizations are starting to turn to CD-ROM as a strategic information management tool. They are using the technology as a means to manage and distribute large amounts of internal information that is critical to their business.

Driving CD-ROM use

Ford Motor Co. is one example of a corporation that depends on CD-ROM as an information management tool. Its New Holland, Pa., subsidiary — an agriculture and construction division manufacturing equipment for farm and industry — recently launched a CD-ROM-based parts ordering service for the North American segment of its worldwide network of dealers.

Ford dealers were looking for a better way to utilize their in-house computer systems for ordering parts without relying on the mainframe or printed manuals as the primary sources of detailed parts information. Before the availability of the CD-ROM service, dealers had to access parts information via modem. CD-ROM technology enabled Ford New Holland, Inc. to provide its dealers with more efficient and cost-effective access to pricing and related information on more than 300,000 parts.



TERRY ALLEN

Cummins Engine Company, Inc., a diesel engine manufacturer based in Columbus, Ind., is another company that has weaved CD-ROM technology into its information management scheme. The company has placed its master price book — 60,000 pages of text and graphics — onto CD-ROM. For the Cummins field people who repair engines, a pilot program providing CD-ROM readers on wheels offers a more efficient way to search the master price book for information than using paper or microfilm. The company felt that the amount of graphics involved made the information impractical for a mainframe computer because such an approach would require converting approximately 8,500 mainframe terminals to graphics-based ones.

An example of a government agency using CD-ROM technology for internal functions is the Minnesota Department of Education. The department was seeking a way to distribute a database of more than 100,000 test questions for its State Assessment Program for students. The database, known as an item bank, was originally developed on a mainframe computer and used for creating tests to measure students on specific subjects throughout the state's school districts. Results from the State Assessment Program help the department determine the effectiveness of its curriculum.

Unfortunately, the department experienced dial-up problems with the system. Putting the database on CD-ROM enabled the department to send the information to users in a form that could be accessed through a standard personal computer and CD-ROM drive.

Many organizations that have successfully used CD-ROM as an information management tool have come to understand that

Iles is section manager for research and development at Hewlett-Packard Co. in Mountain View, Calif.

- **Dispersing critical information companywide**
- **Not just a mass storage device**
- **Positioned as a supplement to paper**

How will UNIX® System V affect your customer base?

As we celebrate 20 years of development, the UNIX® system has become recognized as the standard in operating systems around the world. UNIX System V is the taproot of an ever-growing customer list: one that includes every major vendor committed to open systems, and even some who are not.

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To find out more about the UNIX Software Operation and licensing source code for UNIX System V, call 1 800 828-UNIX.

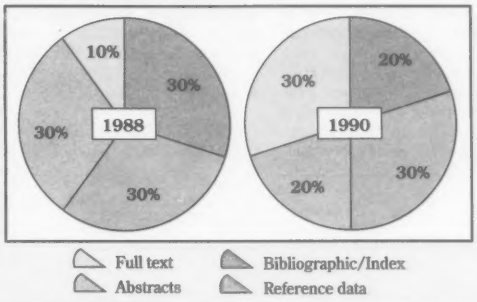
AT&T
The right choice.

CD-ROM is not just another mass storage device that can work on a personal computer. The technology's value lies in the fact that the physical disks can be replicated accurately at a relatively low cost. In this light, CD-ROM is a prime candidate as a distribution media for publishing electronic data companywide.

CD-ROM is an enabling technology, encouraging IS to focus on information management technologies. Thus, the publishing of electronic information becomes, in effect, a means to better manage information. Before the advent of CD-ROM, there was no cost-effective way to bring 600M bytes worth of information to a PC.

CD-ROM information products by market share

By next year, the percentages will shift to more full-text information to better reflect consumer demand



SOURCE: ELECTRONIC TREND PUBLICATIONS — CW CHART: DOREEN DAHLE

It is worth pointing out that just because a CD-ROM can hold 600M bytes of data does not mean that a CD-ROM application requires that much information to make it worthwhile. A CD-ROM that holds as little as 10M bytes may be cost-effective in a given application.

Regardless of the amount of information placed on a CD-ROM, an organization's IS department can realize some fundamental advantages by such an undertaking. The following benefits, for example, tie directly into the IS department's information management charter:

- **Improves accessibility to vital information.** Making information available over a network is not the best answer, because the cost of magnetic storage is too high. As a result, organizations carefully select what data resides on network servers. On the distribution side, nine-track tape is the media of choice for large amounts of information. Unfortunately, examining information on a nine-track tape usually requires large system resources. This factor alone handicaps the data.
- **Increases the productivity of the end user through electronic search features that accompany the information.** Organizations are generating more and more information, but this information is not necessarily of higher quality. That is why it is so important to have the tools to process this data.
- **Centralizes the generation of electronic information under the IS umbrella.** Every large company grapples with different groups creating electronic information in different forms, which in turn leads to inconsistent presentation formats.
- **Transforms the updating of data into a more cost-effective process.** It is not feasible to reprint a large document on a regular basis, even if the document changes. As a result, companies typically send out paper updates that are supposed to be inserted into the main document.

The initial thrust of CD-ROM should be positioned as a supplement to paper, not a replacement. Therefore, the enormous cost savings associated with paper replacement will not immediately surface. Instead, the elimination of paper will evolve out of end-user acceptance of the initial application.

A starting point

Every large organization produces a massive amount of publications in the form of policy manuals, product catalogs, documentation, management reports, market research and so on. The volume of this type of information makes it impractical to use manual search methods, thereby making it an ideal candidate for CD-ROM.

Unfortunately, publishing is an unfamiliar territory for most IS departments and personnel. Internal publishing groups have developed their own terminologies and methodologies. The challenge for IS departments is to promote CD-ROM technology when appropriate and work in cooperation with the publishing people to acquire a foundation of knowledge related to the traditional publishing process.

This is not as easy as it sounds. First, corporate publishing groups naturally tend to emphasize the aesthetics or presentation value of information. These people are driven by the quality of presentation, and the idea of replacing words and paper with ASCII code will be resisted. That is why CD-ROM should be positioned as a supplementary tool for paper. IS should be willing to move toward these documentation groups, as opposed to expecting these groups to move toward information systems.

Second, senior management is also a barrier to launching a CD-ROM-based information management program. Needless to say, senior management prefers to earmark research and development dollars into revenue generators, and corporate publishing groups are cost centers. This barrier can be overcome by showing management CD-ROM's benefits

through a prototype disk.

Rather than producing a lifeless specification, a savvy IS manager can create a prototype to show senior management that the technology is stable and currently available. Beyond gaining senior management's approval, a prototype builds a bridge to the prospective users of a CD-ROM service. In a sense, this represents a role reversal for an IS department that has served as a beta-test site for a hardware or software vendor. Instead, IS is placing a product in the hands of users for feedback on the application. Not only does this assist the product development cycle, but it hopefully generates positive feedback for winning senior management approval.

The development of a prototype does not require a major investment. Some service bureaus are ideal for handling the CD-ROM data preparation process on a onetime basis. In addition, off-the-shelf CD-ROM development tools — retrieval software and user interfaces — are available that minimize up-front costs and reduce development time. The following is a breakdown of the approximate costs required to create a CD-ROM prototype:

- Internal data preparation (staff time) — $40,000.
- Outside data preparation (service bureau) — $30,000.
- Retrieval software and user interface — $2,500.
- CD-ROM mastering process — $3,500.
- Six disks — $500.
- APPROXIMATE TOTAL COST: $76,500

If the CD-ROM-bound information already resides in a structured, electronic form, this will reduce the cost associated with internal data preparation.

Aside from the costs, several management issues arise when considering proper tactics for creating a successful CD-ROM publishing environment. The most important issue is to implement organizationwide standards early in the process. The most effective CD-ROM publishing environments are automated, and automation can only be achieved through standards.

On a global level, think of the CD-ROM publishing environment as a conventional manufacturing environment with information as the raw material. Toward this end, the economic rules of manufacturing apply to CD-ROM publishing, which means that the reduction of labor costs will significantly reduce overall costs.

In any large corporation or government agency, information originates in different file formats, ranging from mainframe databases to ASCII code to word processing files. In addition, the information is stored on several types of physical media including paper, floppy disks, magnetic tapes and tape cartridges.

BEYOND gaining senior management's approval, a prototype builds a bridge to the prospective users of a CD-ROM service.

With such a huge volume of dissimilar information, the largest and most time-consuming task in the CD-ROM publishing process involves the data preparation. A common input format is required to impose a consistent representation upon the different types of documents or information.

The best way to ensure a consistent document structure is to embrace a standard page format throughout the organization, such as the Standardized Generalized Markup Language. By taking this approach, a large portion of the data can be automatically processed into the proper physical and logical formats for CD-ROM storage. The goal is to have a single electronic source that fuels both the printing and the CD-ROM publishing process.

Converting information into the selected page format is accomplished in one of three ways:

- Using an automatic conversion program on appropriately stored electronic documents.
- Manually inserting notation codes into electronically stored documents that do not typically

allow for automatic conversion.

• Scanning paper data using optical character recognition software and hardware, converting the information to ASCII format.

Once the information structure has been consistently represented, the next step is to index and organize the database in a fashion suitable for CD-ROM. There are document formatting programs that translate the complex structure of the tagged documents to a device-independent format (DVI). Next, the program output is turned into ASCII code with a DVI-to-ASCII driver.

At this point, the data in the ASCII files is keyworded and indexed for the retrieval engine software. Typically, this software is capable of searching the index files and locating documents by any named topic. It also provides a specification for the proper indexing of the ASCII files and serves as a tool for building the database. Naturally, the retrieval engine operates in tandem with the user interface.

Again, standards come into play during the indexing process. The logical layout of ASCII files associated with the CD-ROM should conform to the ISO 9660 file format, or the High Sierra Group Proposal, which defines the structure for CD-ROM data files.

ISO 9660 has been accepted by the CD-ROM industry as the standard for volume and file structure of data on compact disk. It is a nonproprietary, read-only structure that ensures that all disks can be read on virtually any combination of drives and computers. This format is a tree-structured approach similar to MS-DOS and Unix with a volume descriptor containing pointers to two directory tables — a root directory table and a two-level path table.

Is it live or is it simulated?

After indexing and organizing the data, the data should be tested. This can be accomplished by a "test disk" — generated by a CD-ROM mastering facility — or by simulating the data as if it were a pressed disk. Test disks are costly and delay the production process — getting a test disk made is essentially the same as getting a "live" master done. Consequently, most CD-ROM publishers choose the simulation route.

By taking this simulation approach, you can test the disk layout for optimal performance. When the optimal performance for the CD-ROM application has been achieved, the data is outputted to nine-track tapes, ready for CD-ROM mastering by the service bureau.

The process of preparing the data for mastering — up to and including putting it on nine-track tape — is called premastering.

CD-ROM premastering systems can be purchased that incorporate software tools to create the database in the ISO 9660 format, simulate the data and output it to a nine-track tape. In addition to premastering systems, it makes sense to explore available CD-ROM production technology wherever possible to avoid reinventing the wheel.

By leveraging existing software products and expertise that aid in indexing the data and creating the user interface, you can achieve major cost reductions and accelerate development.

Not so rosy

Despite its advantages, life is not a bed of roses with the implementation of CD-ROM technology. One possible thorn involves its acceptance within a potentially conservative IS community. Some still view CD-ROM as an emerging technology, and this mind-set can be an obstacle.

In addition, when it comes to preparing the data earmarked for a CD-ROM, there's little margin for error. Once a mastering/replicating facility generates the physical disks from the prepared data, there can be no alterations made. To make a change, the mastering/replicating process must be repeated.

Further, if the CD-ROM application calls for selective access, security becomes a concern. The industry is still working out the data encryption issues surrounding CD-ROM.

For the most part, the technology is ready. Its use in an in-house publishing capacity could be just the ticket for an IS organization that wants to get its feet wet with CD-ROM. •

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*Audit Bureau of Circulations Supplemental Data Report, May 25, 1987

INDUSTRY INSIGHT

Scot K. Sedlacek

Hostile takes over?

Controversy has always surrounded the use of hostile takeovers as an acquisition practice. No wonder: They generally involve huge corporations, incomprehensible amounts of money and personalities that make J. R. Ewing look like a Boy Scout.

Some view them as an assault on shareholder rights by greedy raiders, others as a way to rid languishing public companies of self-serving management in an attempt to restore shareholder value. Boon or bane, however, the hostile takeover has been a rare occurrence in the information technology industry — until now. Is the rare occurrence about to become an accepted industry practice?

Continued on page 84

Sun founder guns for the big leagues

IN PERSON

If Sun Microsystems, Inc. President Scott McNealy was a pitcher in the big leagues, his weapon of choice would be a fastball: straight, hard and right down the middle.

Since co-founding Sun in 1982, the 34-year-old McNealy has nurtured an evolving series of powerful desktop machines that often set the standard in the workstation market.

Along the way, the man who looks more like a fraternity party organizer than the leader of a billion-dollar Fortune 500 firm has made more than his share of enemies. McNealy often speaks with the confident brashness of a kid who just aced his chemistry final, pulling no punches in lambasting industry heavyweights like IBM and Digital Equipment Corp. for what he considers to be their selfish devotion to proprietary architectures.

Sun's latest move to expand a workstation market share that now hovers at more than 28% is a deal with Toshiba Corp., under which the Japanese firm will begin offering a series of low-cost computers based on Sun's Scalable Processor Architecture (Sparc) by next year [CW, May 29].

Sun's McNealy *exudes confidence in firm's standing*

McNealy sat down late last month at his office in Mountain View, Calif., to speak with News Editor Peter Bartolik and Senior Writer James Daly and discuss Sun's past, present and future.

Is there any fear that the Toshiba deal could backfire, and they could start stealing Sun customers from the low end?

Toshiba has always shipped low-end computers that compete against Sun. This is not a question of Toshiba vs. Sun, it's a question of Sparc vs. VAX/VMS or Sparc vs. Mac OS. Toshiba is going to win computer business. Period. If they win it under DOS, OS/2 or a proprietary operating system, there is no way we have a chance of selling add-on computers. But if they make someone a Sparc/Unix/Open Look shop, I can walk in and say I'm 100% compatible with that.

So it's just spread the gospel according to Sparc now and worry about competition later?

Sure. The Sparc/Unix/Open Look world is potentially enormous. If we only get 30% of a potentially $100 billion business, my shareholders will become quite comfortable.

That's counting on a lot of people to swap out of a lot of entrenched equipment.

That's the beauty of Sparc running three times faster at one-fourth the price of Intel, and Unix having thousands more applications and costing a lot less than OS/2. OS/2 would not have existed if we didn't have a strategy that was quite scary to a DEC and [an] IBM.

Do you see Sparc making big inroads into the DOS base?

Absolutely. OS/2 missed a big opportunity. It was late, didn't meet customer needs and doesn't have any software.

What's your perspective on Open Software Foundation versus Unix International?

It's like a world making the transition from trains to autos. OSF and Unix International are like a Ford and a Chevy, while Unix represents the auto industry. The highways are owned by the government and we can use our autos to drive on any street anywhere because the standards are owned by the public. The old VAX/VMS train is going away.

An interesting thing is that Sun was a virtual unknown before this thing backfired on IBM and DEC. They wanted Unix to fold up and go away. As soon as they did this embarrassing thing where they held hands, they lit a promotional smoke bomb. Now it's forcing them to scramble to

Continued on page 82

CTG investment sustains IBM trend

BY NELL MARGOLIS
CW STAFF

BUFFALO, N.Y. — Computer Task Group, Inc.'s (CTG) coffers looked a bit greener and its customer base a bit Bluer last week as IBM announced plans to pay $21 million for a 15.3% stake in the 4,000-person professional services firm.

CTG Chairman and Chief Executive Officer David Campbell hailed the move as a synergistic one that will speed new technologies to both companies' customer sites. IBM currently contracts with CTG to the tune of approximately 5% of the smaller company's revenue.

Prudential Bache Research analyst Charles E. Taylor Jr., however, speculated that the strengthened alliance between IBM and CTG contains at least an element of defensive strategy. Having seen, for instance, AT&T's 1988 acquisition of a computer services firm, IBM might well have "thought it was a good idea to keep a good professional services ally closer to home," Taylor said.

CTG also could be thinking defensively, Taylor said. The recent purchase on the open market of approximately 9% of CTG's stock by Volmac, a company based in the Netherlands, "was not entirely welcomed by CTG — or, at least, so you can infer from the fact that they put in a shareholder rights program soon after it happened," he noted.

Paper chase

Last week's announcement followed IBM's $10.1 million purchase of a 5% equity interest in Atlanta-based IBM Systems Application Architecture developer Management Science America, Inc. (MSA) by less than a week.

That deal in turn came only weeks after the company picked up minority interests in AIX-based software start-up Transarc Corp. and screen tool developer Interactive Images, Inc.

However, an IBM spokesman said that any attempt to read significance into the company's appearing to be on a shopping spree would be misplaced. The CTG buy is "one more in a line of [IBM] investments in companies with promising technologies," the spokesman said.

Analysts viewed the deal as also representative of IBM's tendency to reward loyalty. As with MSA, investing in CTG "is their way of backing companies that have backed them for years," said Robert Therrien, an analyst at Paine Webber, Inc.

Whatever else, Taylor said, the IBM investment — unlike several other recent IBM equity purchases — was not entered into to help shore up a faltering company.

While CTG recently closed "a less than gorgeous quarter," he said, the company has grown approximately 30% annually during the past several years, with an unbroken string of profitable quarters, some $20 million cash on hand and a far-from-exhausted bank credit line. "We're talking healthy company here," Taylor said.

Kuehler now IBM president

BY ROBERT MORAN
CW STAFF

Jack Kuehler, former vice-chairman of the board of IBM, has been elected president of the company. The move puts the 56-year-old Kuehler in one of three posts most recently held by IBM Chairman and Chief Executive Officer John Akers.

"There are two ways to view this announcement — as oriented to succession or recognition," an IBM spokesman said. "This is a recognition for continuing contribution."

But the announcement of the coveted presidency is implicitly oriented toward succession, one analyst said. "Akers is trying to send the message to any comers — particulary managers of IBM lines of business — that the presidency won't be open for a while," said Bob Djurdjevic, president of Annex Research in Phoenix.

Even though IBM does not have a mandatory retirement age, key executives traditionally relinquish their positions at age 60. Kuehler, 56, is thus likely to retire well before Akers, 54, steps down.

Kuehler's election *raises questions*

Indeed, the IBM spokesman said that Kuehler's appointment will not prompt IBM organizational changes, and the organizations that have reported to Kuehler will continue to do so.

"IBM has no plans to appoint a new vice-chairman," he said.

Questions of successorship aside, the appointment gives Kuehler more clout. "In the past, the vice-chairman has not been perceived as the alter ego of the chairman," said Sam Albert, president of Sam Albert Associates, a consultancy based in Scarsdale, N.Y. "Since Kuehler can now act on behalf of the chairman, the position gives him more clout, IBM more executive focus and benefits customers with more executive face time."

Albert added that Kuehler has a strong reputation both as a technical person and as a sales and marketing presence.

IN BRIEF

Can't have it all

Storage Technology Corp. has acquired **Aspen Peripherals Corp.** for approximately $46.9 million of company stock. With Aspen, Storage Tek will gain a strategically positioned IBM-compatible tape cartridge line directed at the OEM midrange market. What Storage Tek will not gain is current Aspen chief and Storage Tek founder **Jesse Aweida**, who reportedly will no longer be associated with either firm.

Extra credit

The bank waiver granted to **Control Data Corp.** six weeks ago has been extended through June 30 to allow CDC and its banks to negotiate a new credit arrangement. Also extended was CDC's credit line, now up from $30 million to $50 million.

Danish, anyone?

Desktop boomer **Compaq Computer Corp.** is nobody's idea of a dog; nevertheless, the firm plans to be a great Dane. Late last month, Compaq continued its surge into Europe with the opening of a wholly owned subsidiary in Copenhagen.

Chip gambling

The Pacific Stock Exchange announced last week that it will begin trading direct random-access memory futures contracts during the first quarter of 1990.

Add 'em up

Fresh from an enthusiastic industry reaction to its purchase of Apollo Computer, Inc. and California's designation of its one-car garage startup site as a historical landmark, **Hewlett-Packard Co.** turned up at the Institute of Electrical and Electronics Engineers, Inc. (IEEE) 1989 Honors Ceremonies last Friday to pick up the IEEE Corporate Innovation Recognition award. The nod went to HP for the HP-35, which according to the IEEE is "the first full-function shirt-pocket-sized scientific calculator."

Newton Minow need not apply

AT&T Vice-President Daniel Lankford last week proposed to a U.S. House of Representatives subcommittee that the Department of Commerce appoint a high-definition television (HDTV) executive to oversee development of the U.S. HDTV industry. In his testimony, Lankford stressed domestic presence in HDTV development as an investment in the country's telecommunications, computer and semiconductor industries.

Sun founder

CONTINUED FROM PAGE 81

go do Unix in a big way. That wasn't what they wanted.

What about general-purpose software for Unix? Both Lotus and Ashton-Tate said that they would develop for AT&T's Unix System V, Release 4, but since they said that, nothing has been introduced.

At the Software Publishing Association conference recently, [Lotus President] Jim Manzi said he would support all three instruction sets from Sun: 386I, Sun-3 and Sparc.

When is that coming along?

You'll have to ask him. But our announcement with Toshiba will also attract personal computer software vendors in a major way. Developers are still a little nervous about writing software on top of an operating system that is controlled monopolistically by their major competitor — Microsoft. Nobody believes AT&T will dominate the PC software applications business like Bill Gates does.

What affect will the Hewlett-Packard/Apollo deal have on the workstation market and Sun in particular?

None. The HP and Apollo lines existed before the merger and will exist after. But both companies now face many internal management issues. Which instruction sets do they choose? Which operating systems do they go with? Which windowing environment? Which graphics libraries? What do they do with the extra management and sales force? Mergers are not easy, and they will be a long time resolving those questions.

What sort of distribution channels are you looking at now that Next has cozied up to Businessland? Are you considering Microage or Computerland?

It's in the retail industry's best interest to get the world to believe the only way to distribute in volume is through them. But the retail outlets take their overhead and don't necessarily have the single vendor's

motivation in mind. Plus, they don't understand the Sun product line as well as a Sun sales rep. They have to know a little about a lot.

Right now, our value-added resellers are very effective in selling to small businesses while direct sales sells to large corporations. Next would have you believe that the retail stores are the only way to sell volume. Ask a company like Du Pont: "Do you want to buy direct or indirect?" They'll tell you that when they're buying 30,000 workstations, they want to buy direct.

Sun has fallen out of favor on Wall Street lately. Any opinion?
We've never been in favor on Wall Street. They're very concerned with the current quarter as we're making massive investments in all parts of our company to get set up for the 1990s. We've got to grow this thing and do a lot of things much faster than we'd like to be doing. Wall Street doesn't see this opportunity five years out. They get paid every third nanosecond. They don't know how to deal with a company that's taking as big a swipe at the computer industry as we are.

Is there a possibility of Sun acquiring or merging with another firm?
For the right price, Sun can be bought. For $100 a share — cash, right now — McDonald's can merge with us. There isn't any public company with a board of directors that is all awake that would say no to that.

Start-up company makes passage from India with Unix

BY JEAN S. BOZMAN
CW STAFF

What's big, has three letters in its trademarked name and dominates the computer industry in its native land?

Try HCL Ltd., one of India's largest computer firms, which recently popped up in Silicon Valley to test the U.S. computer marketplace. HCL stands for Hindustan Computers Ltd. When IBM temporarily pulled out of India in the 1980s, HCL became one of the largest domestic computer suppliers by default, says HCL America, Inc. Chief Executive Officer Yogesh Vaidha.

The $150 million concern — a Unix vendor since the late 1970s — started up HCL America with $25 million in privately raised shareholder funds. The primary source of these funds is a group of 55 Indian businessmen, although some shares will be sold to the public.

The business plan began to take shape earlier this year, with a staff of 20 — and several thousand square feet of rented space in a Sunnyvale, Calif., industrial park.

HCL America plans to use the knowledge of HCL's 3,500 Indian employees and Unix expertise as a wedge into the hotly contested U.S. Unix market.

"That experience [with Unix] is coming to me at one-sixth the [labor] cost any U.S. corporation has," Vaidha said. Leveraging HCL's Indian investment, he said, will allow the U.S. company to enter the market with prices that could be as low as between $35,000 and $45,000 for a one- or two-processor system.

> HCL AMERICA plans to use the knowledge of HCL's 3,500 Indian employees and Unix expertise as a wedge into the hotly contested U.S. Unix market.

The small start-up's aim is to sell its Unix-driven file servers to the U.S. federal government, various vertical markets and the telecommunications industry. The HCL M3000 series is based on Motorola, Inc.'s 68030 processor and on AT&T's Unix System V, Release 3.

"The advantage we have is that our current Unix system has been tested in the commercial marketplace in India and Asia," said product director Raj Sirohi.

Also, the HCL staff claims to have an advantage over its Asian competitors in that English is a native language in India.

At a time when Unix solutions are becoming a commodity item, HCL is offering users its collective experience with commercial Unix.

"Our expertise lies in tying all the elements of a Unix system together and in getting more performance out of a Unix system than anyone else. We are an Indian company, and we're very proud of it. But the manufacturing and support of these machines will be here in Sunnyvale, Calif. HCL America, Inc. is an American company."

HCL America's Sunnyvale offices will soon be expanded to 34,000 square feet — much of it factory space for the final assembly of the M3000 machines.

Tucked behind larger Silicon Valley headquarters, including that of Ardent Computer, Inc., HCL America has just 15 employees on-site. Other executives, Vaidha said, are scattered around the country, working out of single-person sales offices.

Sedlacek

CONTINUED FROM PAGE 81

Hostile takeovers have long been viewed as taboo in information technology for two basic reasons:

- It was felt that people were the principal asset of an information technology company. A mass exodus of the target's most valuable asset was seen as the ultimate poison pill.
- In information technology markets, product life cycles continue to shorten, research and development expenditures continue to rise, and technical skills are in short supply. Loss of key personnel, coupled with the unstable environment of a highly leveraged firm with minimal R&D investment, made the traditional hostile takeover of an information technology firm a high-risk situation.

However, there is an increased recognition that the real value in more mature information technology companies goes far beyond people and is, in fact, created by access to an established customer base, proven product technologies, attractive geographic markets and channels of distribution — assets that even hostile takeovers won't destroy. This value shift means that tomorrow's information technology raiders will not necessarily mirror the adversarial likeness of a T. Boone Pickens or Carl Icahn but might emerge from the ranks of companies positioned to realize the potential synergies of the acquisitions in question.

Also, for many information technology players, diversification into new product lines and markets is a must for survival, and buying an existing firm is often the quickest, easiest route. With the market for public information technology stocks remaining at discounted post-crash levels, buying is easier than ever.

Historically, hostile-takeover targets have tended to be undervalued public companies with a large institutional ownership, showing strong cash flow or holding leverageable assets and competing in slowed markets. With the traditional barriers crumbling, information technology firms exhibiting such characteristics will be increasingly vulnerable to hostile activity. Three industry segments to watch are hardware manufacturers in maturing market segments, processing services companies and mainframe systems software companies.

Combination is not a new phenomenon in the information technology industry. According to Broadview Associates, more than 2,000 transactions were consummated during the last five years, making this the most merger-prone industry in the U.S.

The dynamics of the information technology marketplace indicate that the pace of merger and acquisition activity will continue. There will always be information technology companies in industry segments that are at a point in their life cycles marked by the characteristics that invite hostile bidders. As these segments go through a rationalization, we will see more hostile takeover attempts in the information technology industry.

However, given the general characteristics of the information technology industry and the limited number of public information technology firms that fit the anatomy of a hostile takeover, it appears unlikely that such transactions will come to dominate the industry. Some 80% of all acquisitions are private transactions or divestitures, which by definition cannot be hostile. In addition, nearly 50% of public information technology firms are small market capitalization stocks (less than $50 million), which tend to have a high degree of inside ownership.

Even as unwelcome suitors begin to form a larger exception, friendly deals are likely to continue to be the rule.

Sedlacek is an associate at Broadview Associates, a mergers and acquisitions and investments banking firm based in Fort Lee, N.J.

EXECUTIVE CORNER

CFO steps up to presidential slot

Tom Nicoletti, chief financial officer and chief operating officer of Procase, will assume responsibilities as president and chief executive officer. He succeeds **Alberto Jiminez**, who left earlier this month due to personal reasons. Nicoletti was also elected to the board of directors. Previously, Nicoletti was founder and CFO at LAM Research, a semiconductor equipment company based in Fremont, Calif. While there, he was responsible for financial, personnel and treasury activities and also succesfully led the company through its initial public offering in 1984. Nicoletti has also held managerial positions in finance with Saratoga Semiconductor, Fairchild Camera & Instrument Corp., National Semiconductor and Advanced Micro Devices.

Phoenix Technologies has announced that **President Lance E. Hansche** will take on the additional title of CEO. Hansche assumes this responsibility from **Neil J. Colvin**, who will retain the role of chairman and also add the new title of chief technical officer.

John R. Zeeman has been appointed by **Umberto Nordio**, chairman of Galileo, to CEO, succeeding **Justin Dukes**. Zeeman held positions with United Airlines as executive vice-president of marketing and planning. He also was chairman for Covia Partnership.

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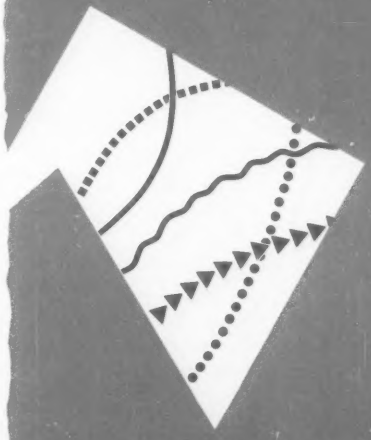

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Western firms in Beijing rocked by unrest

BY CHRIS BROWN
IDG NEWS SERVICE

HONG KONG — Political demonstrations in China last month severely hampered the computer business in Beijing, with many Western companies sending their foreign staffs out of the capital until the unrest subsides.

Wang Laboratories, Inc., Hewlett-Packard Co., Prime Computer, Inc. and AST Research, Inc. all pulled their staffs from Beijing. Most firms contacted by *Computerworld* reported that they were officially remaining open in Beijing, although business had come to a near halt.

The major difficulty reported in Beijing was that those responsible for computer purchases and services were either not to be found or immobilized. "We've found out that the end users have disappeared," said Karl Mclean, Hong Kong and China manager at Memorex Telex N.V. "They're either not in their offices, or when they are in the offices, no one's making decisions until the next power" is in place.

A Wang source, who asked not to be identified, agreed. "The problem is that it is hard to get in touch with the end users because all of them are [Communist] Party members," the source said.

Western firms also complained that transportation had broken down throughout Beijing, and some communication services were blocked. During the press blackout, students clogged facsimile lines by sending news reports back and forth to other Chinese cities, one source said.

Memorex Telex, like other international companies such as Intergraph and Wyse Technology, concentrates its Far East business in Hong Kong and has only a few staff members stationed in Beijing. Other U.S. firms have been investing heavily in China since the early 1980s and have more at stake. IBM, Digital Equipment Corp., Wang and HP all have major commitments in the Chinese capital, though not all chose to return their staff members to Hong Kong.

Wang, for instance, offered its expatriate staff the option of coming back to Hong Kong, and about 15 employees — roughly 60% of its foreign labor force — chose to return, according to a source at Wang, who wished to remain anonymous. HP also had an unspecified number of staff returning, most of whom were tentatively scheduled to return this week, according to an HP source.

However, officials at both IBM and DEC said that neither firm had evacuated staff members nor had plans to do so.

Western firms generally view the recent demonstrations as a glitch in China's record of providing a stable, if bureaucratic, business environment. Most employees who were sent out of China last month have returned. "When one does business in a place like China, one sort of expects changes to occur on a reasonable basis," said Peter Fletcher, general manager of Cullinet (Hong Kong). "I don't think the China [business climate] now is much worse that it was in the Philippines a few years ago. I have also done business in Thailand during a couple of attempted coups there. China has proven to be one of the more stable countries."

According to Saiman Hui, managing director at International Data Corp. (China), China is too dependent on foreign computer firms for business conditions in Beijing to remain unsettled for long. "In the short term, there will be some influence [on the computer industry] . . . but in the long term [Western firms] don't think there will be any bad effects," he said. "China still has to modernize. It still has to import the advanced technology and equipment. That will not change."

Denis Simon, associate professor of international business at Tufts University in Boston, was in Hong Kong during the upheaval to speak at the IDC China Computer '89 Conference. He pointed out that Chinese Premier Li Peng had long favored high technology and had many supporters in key positions in China's technical ministries.

NICKELS & DIMES

Datapoint reported a net loss of $21.3 million for its third quarter ended April 29. Revenue for the quarter totaled $75.5 million, compared with $88.4 million for the third quarter of the prior year.

General Parametrics Corp. announced second-quarter net sales of $6,217,000, compared with net sales of $6,158,000, during the second quarter of fiscal 1988. Net income for the quarter ended April 30 was $530,000, compared with $1,024,000 for the second quarter of last year.

Scientific Micro Systems, Inc. reported a net loss of $754,000 for the first quarter in 1989, compared with a net loss of $9.3 million in the first fiscal quarter of 1988. The 1989 first-quarter results included an operating income of $576,000.

Japanese electronics giant **Matsushita Electric Industrial Co.** posted a 30% consolidated net income increase on a sales gain of 9% for the fiscal year ended March 31. Consolidated net income for fiscal 1989 climbed to $1.62 billion. Consolidated sales for 1989 hit $41.70 billion.

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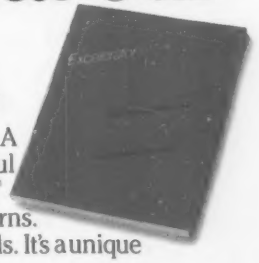

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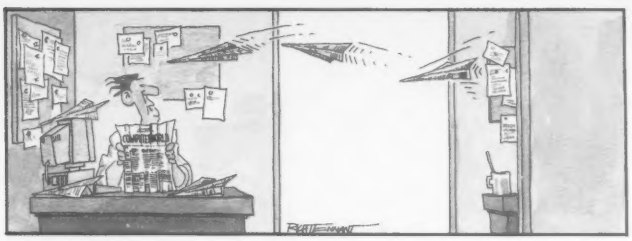

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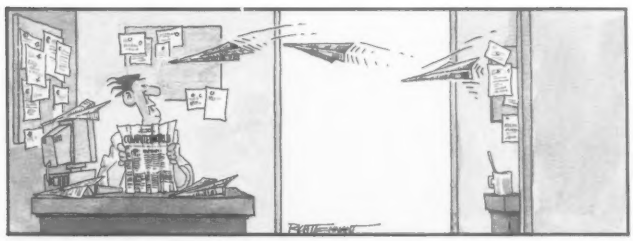

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Software start-up questions

A successful software company requires more than just a good product

BY JOHN RODRIGUES
SPECIAL TO CW

The idea of launching a software company holds a perennial fascination for many information systems professionals yearning to be entrepreneurs. Before taking the gamble, however, it is wise to absorb as much information as possible.

One important question to consider is what distinguishes the software market from others. Another key thrust is learning how to analyze the market and the survivability of new software products. Do not overlook the basics of a business plan, sources of capital and the need for sound legal and financial advice.

The low overhead cost for software development makes it easy to get into the business. To stay in the business, however, is not so easy. To win, you try to maximize your strengths and fill customer needs, especially those requiring your unique expertise.

Today's customers want more than just software — they demand service. "The customer is always right" is the right attitude for vendors.

The sophistication of customers can vary, as it differs between end users and information systems professionals. However, any customer could be looking for vendor support that includes standards, interfacing with other products, training, documentation, a long product life, upgradability, responsiveness and cooperation with vendors of complementary products.

With some software vendors now earning almost half their income from service-related activities, the signs are unmistakable. End users do not live by product alone. A successful software company is one that satisfies customer needs for service and support.

There are plenty of potential environments for new products: new techniques such as hyperware, migration from larger systems to personal computers, emerging technologies such as optical storage, changes in computing such as work group productivity, integration of off-the-shelf products such as desktop publishing or local-area networks and add-ons to established products.

Gauging the market

With so many points of entry available to the would-be entrepreneur, the first step is to identify your target market. Analyze the market by various sectors, including geographical regions and types of products and customers.

Aim to sell to the mainstream of the market for greatest security. Take advantage of trends such as connectivity and Macintosh-like interfacing. Practice course-correction; you need to think about potential technological developments that could undercut your sales.

Avoid competition with big firms unless there is a niche to fill. Be selective about the hardware the product will run on — the price/performance ratio of computer equipment will keep falling. To survive, the product must be faster, better, cheaper or more glamorous than the competitions' offerings.

Once you have matched your strategy to your target market, determine the specific end-user requirements. Is the market general business, a vertical industry or a niche? Figure out the number of potential customers and the number of likely sales from them. What is a good selling price? Calculate the net profit per sale. Sources of information other than the potential customers include sellers of software and related products, trade groups, academic experts and consultants.

Some companies use a vaporware announcement to gauge the market's reaction before actually producing anything, but this is not appreciated by potential customers.

Compare the types of products and customers with the competition's offerings and strategies. Examine various methods of competition, such as lower prices, innovative terms, superior benefits or better support. Spell out development plans for sales and marketing, service and warranty policies, product installation and support, staffing, engineering, administration and finance.

Also, figure out the number of potential customers and the number of likely sales they will generate. What is a good selling price for your product? Calculate the net profit per sale.

A cost/benefit analysis can help you determine how customers justify a purchase. The analysis involves a graph with two axes — the vertical one reflecting cost and the horizontal one depicting time. Plot the cumulative benefit to the customer over time, perhaps as a rising curve.

Also, plot the cumulative costs to the customer over time, possibly as a flat fee. The payback for the user comes at the intersection of these two lines, which is where the product has paid for itself. Such an analysis can help determine the size of your market and the likely selling price.

Finally, a new product can be evaluated against ideal standards in areas such as marketing, production and growth.

When it comes to marketing, the ideal product will use current distribution channels. It complements any other products that you market and aids in their sales.

Such a product costs less than the competing products but is of the same quality or offers more attractive features. It addresses divergent needs with as few versions as possible.

This ideal product should be developed using available equipment, current skills and a minimal staff.

Demand for any product will grow if it fulfills a need and provides a high degree of added value while facing a restricted number of competitors and a growing number of end users.

END USERS do not live by product alone. The successful software company is one that fills customer needs for service and support.

Rodrigues consults internationally on microcomputer product development at Cadsmith, Inc. in Marlboro, Mass.

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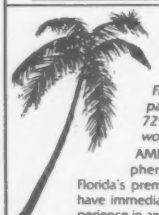

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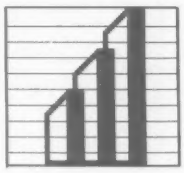

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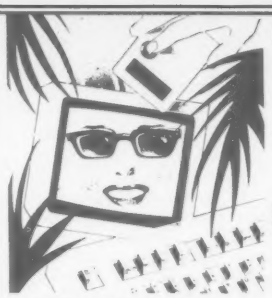

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MARKETPLACE

Read fine print on licenses

Before signing the dotted line, be sure your legal interests are protected

BY LISA GUISBOND
SPECIAL TO CW

Alarm bells should ring when wary consumers take a quick look at a software license agreement, but all too often, the bells remain silent.

Just compare the part of the agreement devoted to the vendor's obligations with the verbiage describing the purchaser's responsibilities, says Carl Kane, director of management advisory services at the New York office of accountant Kenneth Leventhal & Co. The weight of words usually comes down heavily on the purchaser because the vendor has conducted the legal research necessary to protect its interests, Kane says.

Kane and other experts advise that licensees devote considerable resources to ensure that their interests are equally secure. They begin with the premise that the vendor's pro forma contract should not be accepted as is.

What follows are some of their strategies for avoiding pitfalls by drafting a comprehensive, well-thought-out software license agreement:

• **Record all commitments and obligations the vendor agrees to.** This is to ensure that the vendor is delivering what it promised and is legally obligated to do so, says Esther Roditti Schachter, a partner in the New York law firm Schachter, Courter, Purcell & Kobert and editor and publisher of "Computer Law & Tax Report," a monthly newsletter. Make sure both verbal and written agreements are incorporated into the contract, Schachter says.

• **Carefully spell out acceptance terms.** "You don't want user acceptance until it's all tested satisfactorily," Schachter says. "And by tested, I don't mean tested with some package that the vendor has but with your own data. And you do it yourself."

• **Assign responsibility.** If you're acquiring software that a number of vendors are involved with, make sure one party is answerable to you. Alternately, Kane suggests, get a definitive list of who handles what, including diagnosis of problems.

• **Consider your future needs.** Kane suggests that before you sign the contract, you take advantage of any leverage you might have to obtain advantageous terms on future acquisitions. If you can predict what additional software or services you may eventually require, this is the time to negotiate a favorable deal.

• **Include effective remedies for error correction.** This becomes important when the vendor cannot promptly fix a bug because of the departure of the code writer. Clarence Ridley, a partner in the Atlanta-based law firm King & Spalding, notes that custom software vendors often suffer from a high turnover of skilled programmers.

"Availability of program source code is a frequent contractual remedy," Ridley says. "However, the license from the vendor must permit use and alteration of the code by a third party hired by the customer to perform the error correction."

• **Ensure adequate indemnification against copyright infringement suits.** Kane and Schachter agree that most contracts cover this point to some extent, but licensees need to ensure that the coverage is extensive enough to address their companies' needs.

As Schachter points out, more and more software is not peripheral to the business but vital to the operation. If something happens to prevent its use, the business could grind to a halt.

Kane warns that indemnification should not necessarily be limited to the cost of the software but should include all legal costs and any other expenses incurred as a result of a suit. Schachter goes so far as to suggest considering a clause obligating the vendor to replace the package with noninfringing software, taking into account limits on the vendor's resources.

> IF YOU'RE acquiring software that a number of vendors are involved with, make sure one party is answerable to you.

• **Seek to maintain operations in the event of a dispute.** If the conflict is between the vendor and the user, as opposed to a third party, consider inserting a clause that allows you to continue using the software if the issue is noncritical, Schachter says.

"You definitely have to look at the entire transaction and see if that kind of clause would be helpful. The idea is really to keep the wheels in motion if in fact the dispute isn't about a central issue," she says.

• **Protect yourself in the event that the vendor files for bankruptcy.** Kane suggests stipulating that there will be prior notice given in the event of bankruptcy to allow the user access to the software source code. "That's typically done in an escrow agreement if they don't want you to have the source code in the beginning," he says.

• **Read the fine print.** This is classic advice but worth repeating. Kane says his firm saw one contract stating that service hours would be based on working hours in the time zone of the vendor's location, which were not necessarily those of the user's site.

In summary, Kane says, do not take lightly an investment in crucial software, even though vendors' contracts sometimes "read like you're buying a box of paper clips."

Guisbond is a free-lance writer based in Cambridge, Mass.

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The BoCoEx index on used computers

Closing prices report for the week ending May 26, 1989

	Closing price	Recent high	Recent low
IBM PC Model 076	$600	$800	$450
XT Model 086	$850	$1,150	$850
XT Model 089	$1,200	$1,400	$950
AT Model 099	$1,600	$2,000	$1,500
AT Model 239	$1,800	$2,100	$1,775
AT Model 339	$1,875	$2,375	$1,800
PS/2 Model 60	$3,075	$3,100	$2,500
PS/2 Model 80	$3,850	$4,100	$3,100
Compaq Portable I	$700	$750	$550
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Portable III	$2,775	$2,950	$2,200
Portable 286	$1,700	$1,975	$1,675
Plus	$900	$1,200	$900
Deskpro 286	$2,000	$2,350	$1,800
Deskpro 386	$2,625	$2,900	$2,500
Apple Macintosh 512	$550	$775	$525
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An author's ACE in the hole?

A CBT generator can cut costs, but some question whether it's worth the price

BY JANE STEIN
SPECIAL TO CW

Occasionally, the computer-based training (CBT) field finds a new wrinkle in the realm of courseware development. First, special-purpose authoring languages such as Computer Teaching Corp.'s Tencore took most CBT development out of the hands of Cobol programmers.

The early 1980s saw the arrival of menu-driven authoring systems that allowed instructional designers with minimal programming skills to take control of the authoring process. Goal Systems International, Inc.'s Phoenix is now the most widely used of them; the latest edition of the *CBT Guide* by Weingarten Publications, Inc. in Boston, lists a total of 68 authoring systems that accommodate every conceivable platform.

In 1986, Behaviortech, Inc., based in Irving, Texas, introduced a micro-based authoring system dubbed Exemplar, the first commercial authoring system that incorporated expert systems technology.

Now, Elron Technologies, Inc. in New York, an American subsidiary of an Israeli company, has entered the scene, waving the artificial intelligence flag over its Automatic Courseware Expert (ACE). While Exemplar focuses its expert systems technology on tailoring interactions to the student, ACE aims to relieve the author of much of the front-end work of courseware development. The $180,000 system is based on a customized Digital Equipment Corp. VAX 3200 minicomputer.

Passing the beta test

ACE, which recently emerged from beta testing, has been purchased by four American companies so far — AT&T, Pennwalt Corp., General Dynamics Corp. and Unisys Corp., all of which were beta-testers.

ACE works like this: An operator sits down at the console and runs through a section of any software application — mainframe, mini or micro. ACE automatically logs the operator's keystrokes and, on instruction, captures selected screen images. Then, a few commands at the main console instruct ACE to generate the courseware.

The result is a short but complete micro-based CBT module on the function just demonstrated, from introductory screen to practice exercises. Users can then take advantage of ACE's extensive options for further customization and elaboration. Elron says that the ability to deliver mainframe-based courseware is on its way.

Lorraine Mitchell, head of the ACE project at Pennwalt, a Philadelphia-based chemical manufacturer, says with it she can produce and refine a half-hour tutorial in a 40-hour work week. "Making no modifications, I can do it in two days," she says. That contrasts with the typical 200 to 400 hours of development for an hour of CBT courseware using other systems.

Despite such apparent virtues, the high price of a dedicated system for producing simple tutorials on basic computer operations can be troublesome. The prices of more traditional systems range from $79 for the stripped-down micro-based Pareto from Information Processing Associates to about $61,000 for perpetual rights to the Phoenix mainframe version.

To show the cost-justification process, assume a $35,000-a-year CBT developer needs 150 hours to produce a half-hour tutorial using a traditional system such as Phoenix. Each tutorial costs about $3,000 in staff time. With ACE, the developer may produce the tutorial for $700, using Mitchell's estimate of one week per course, for a savings of $2,300 per tutorial. It sounds great, but you would have to produce 78 tutorials before recouping the price of the system.

ACE bandage

If the information systems department used ACE to replace off-site, stand-up lecture courses, as Pennwalt is doing, the financial return would be much quicker, users say.

However, firms that have resisted the siren call of CBT have done so largely out of doubts about its quality and effectiveness. Even traditionally produced CBT is much cheaper than classroom training.

Although ACE ups the ante on the cost side, it does not do much to allay concerns about whether to use CBT as a primary training medium.

However, direct cost savings are not the only reason to adopt an expensive new technology. Larry Page, manager of training and development at the Data Systems division of General Dynamics in St. Louis, argues that ACE's speediness redefines his economies of scale. "We can go back and reassess all those [courses] we bypassed in the past because we didn't have a large enough population to justify the training development cost," he says.

Robert M. Rubin, Pennwalt's vice-president of MIS, says that distributed computing in support of decentralization of business units is the inevitable and desirable wave of the future. He says fast and flexible training is critical to the growing independence of his company's individual business units and may not require strict cost-justification.

"When it comes time for something that is potentially a breakthrough in the way you do business," Rubin says, "you may be stretching it a little to say you're absolutely certain on the dollars back."

Stein is a free-lance writer based in Arlington, Mass., and is former editor of *Data Training* and *CBT Directions*.

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June 19		Micro DBMS
June 26	Restructuring MIS — Organizational Impact of Downsizing	
July 3	Open	
July 10		Software for IBM Midrange
July 17	Networking — The Human Side of LAN Use	
July 24	Restructuring MIS: New Organizational Models	

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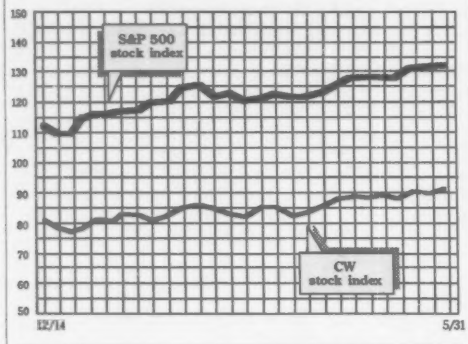

Indexes	Last Week	This Week
Communications	116.7	119.0
Computer Systems	97.5	98.5
Software & DP Services	118.3	120.0
Semiconductors	62.3	64.8
Peripherals & Subsystems	78.6	78.0
Leasing Companies	116.3	111.9
Composite Index	91.5	92.1
S&P 500 Index	134.2	134.5

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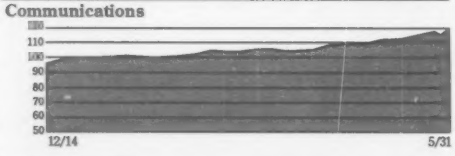

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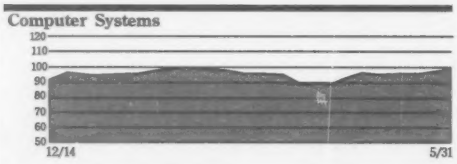

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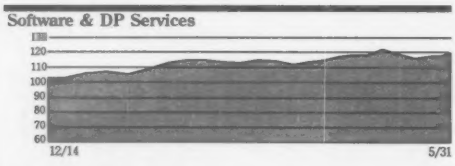

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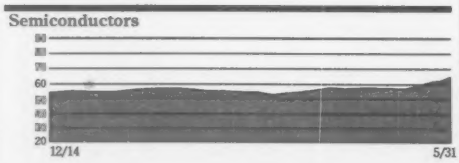

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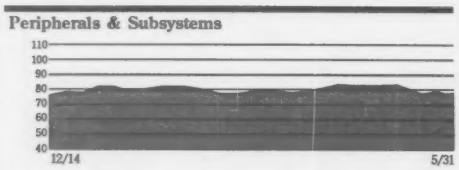

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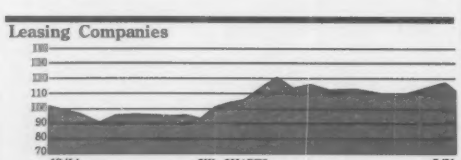

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CLOSING PRICES WEDNESDAY, MAY 31, 1989

E X C H		52-WEEK RANGE		PRICE CLOSE MAY 31, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	61	44	59.5	0.1	0.2
Q	ANDREW CORP	22	15	20.25	0.0	0.0
Q	ARTEL COMM CORP	7	2	6	1.2	24.7
N	AT&T	38	24	35.625	0.1	0.4
Q	AVANT GARDE COMP INC	3	0	0.5	0.0	0.0
Q	AVANTEK INC	7	4	4.875	0.3	5.4
N	AYDIN CORP	16	13	14	0.1	0.9
N	BELL ATLANTIC CORP	88	68	86.875	0.4	0.4
N	BELLSOUTH CORP	50	39	48.5	0.1	0.3
Q	COMPRESSION LABS INC	8	3	7	0.0	0.0
Q	COMPUTER NETWORK TECH	2	1	1.844	0.2	11.3
Q	CONTEL CORP	59	32	56.875	0.6	1.1
Q	DATA SWITCH CORP	9	4	4.5	0.0	0.0
Q	DIGITAL COMM ASSOC	38	17	21.625	-0.3	-1.1
Q	DYNATECH CORP	23	17	17.75	0.3	1.4
Q	FIBRONICS INTERNATIONAL INC	6	3	6.25	0.9	16.3
Q	GANDALF TECHNOLOGIES	8	4	5.5	0.0	0.0
Q	GENERAL DATACOMM INDS	6	3	5.25	-0.1	-2.3
N	GTE CORP	54	37	53.125	0.5	1.0
Q	INFOTRON SYS CORP	13	10	10	0.3	2.6
N	ITT CORP	60	46	59.875	1.6	2.8
N	M A COM INC	11	8	8.125	-0.1	-1.5
Q	MCI COMMUNICATIONS CORP	40	14	39	0.1	0.3
Q	NETWORK EQUIPMENT TECH INC	25	14	24.75	0.0	0.0
Q	NETWORK SYS CORP	12	8	8.125	0.0	0.0
N	NORTHERN TELECOM LTD	20	14	17.375	0.4	2.2
Q	NOVELL INC	38	23	35.5	-1.3	-3.4
N	NYNEX CORP	79	63	78.5	0.6	0.8
N	PACIFIC TELESIS GROUP	42	28	40.25	-0.4	-0.9
A	PENRIL CORP	5	3	4.875	0.0	0.0
N	PLESSEY PLC	46	25	42.5	0.0	0.0
N	SCIENTIFIC ATLANTA INC	18	10	17.75	0.6	3.6
N	SOUTHWESTERN BELL CORP	54	36	51.625	-0.4	-0.7
Q	3 COM CORP	29	16	27.5	1.4	5.3
N	U S WEST INC	71	53	68	-1.1	-1.6
	Computer Systems					
Q	ALLIANT COMPUTER SYS	7	3	5.688	0.3	5.8
Q	ALPHA MICROSYSTEMS	8	5	7	-0.4	-5.1
Q	ALTOS COMPUTER SYS	10	6	6.75	-0.3	-3.6
A	AMDAHL CORP	28	16	22.875	1.4	6.4
Q	APPLE COMPUTER INC	49	34	47.75	0.0	0.0
N	BOLT BERANEK & NEWMAN	19	7	8.5	0.0	0.0
N	COMPAQ COMPUTER CORP	95	50	94.375	5.3	5.9
Q	COMPUTER AUTOMATION INC	9	3	3.75	-0.3	-6.3
Q	CONCURRENT COMP CORP	4	5	6	0.1	1.0
N	CONTROL DATA CORP	28	16	20.875	0.3	1.2
Q	CONVEX COMPUTER CORP	15	7	14.25	0.5	3.6
N	CRAY RESH INC	89	48	52.375	1.1	2.2
Q	DAISY SYS CORP	12	3	3.75	0.0	0.0
N	DATA GEN CORP	25	14	18.75	0.4	2.0
N	DATAPOINT CORP	6	3	3.625	0.1	3.6
Q	DELL COMPUTER CORP	13	7	8.5	0.4	4.6
N	DIGITAL EQUIP CORP	122	86	91.875	-0.3	-0.3
N	FLOATING POINT SYS INC	4	2	2.75	0.1	4.8
N	HARRIS CORP	33	25	31.875	1.5	4.9
N	HEWLETT PACKARD CO	62	44	54	0.4	0.7
N	HONEYWELL INC	80	57	75.375	-0.9	-1.1
N	IBM	131	106	109.625	-0.1	-0.1
Q	INFORMATION INTL INC	16	13	15.75	0.3	1.6
Q	IPL SYS INC	7	1	6.375	0.3	4.1
N	MAI BASIC FOUR INC	21	7	6.75	-0.5	-8.0
N	MATSUSHITA ELEC INDL LTD	219	160	175.5	-0.1	-0.1
Q	MENTOR GRAPHICS CORP	44	23	43.5	3.8	9.4
N	NBI INC	5	1	2	-0.1	-5.9
N	NCR CORP	70	51	56.625	-0.9	-1.5
N	PRIME COMPUTER INC	21	12	16.375	0.0	0.0
Q	PYRAMID TECHNOLOGY	20	11	13.375	-1.1	-7.8
Q	SHAREBASE CORP	4	2	2.5	0.3	14.3
Q	SILICON GRAPHICS CORP	25	14	19.5	-1.0	-4.9
Q	STRATUS COMPUTER	34	21	33	1.8	5.6
Q	SUN MICROSYSTEM INC	23	13	22	0.4	1.7
Q	SYMBOLICS INC	3	1	1.938	-0.1	-4.6
Q	SEQUENT COMPUTER SYS INC	28	14	26.875	0.8	2.9
N	TANDEM COMPUTERS INC	21	12	18.25	2.0	12.3
N	TANDY CORP	49	38	43.875	-0.9	-2.0
N	ULTIMATE CORP	14	8	10.625	-0.3	-2.3
N	UNISYS CORP	39	25	26.625	2.0	8.1
A	WANG LABS INC	12	7	8.125	-0.1	-1.5
	Software & DP Services					
Q	ADVANCED COMP TECH	4	1	1.625	-0.1	-7.1
Q	AMERICAN MGMT SYS INC	19	12	15.125	0.4	2.5
Q	AMERICAN SOFTWARE INC	16	8	15.75	-0.3	-1.6
N	ANACOMP INC	12	5	6.625	0.5	8.2
Q	ANALYSTS INTL CORP	20	8	19	0.5	2.7
Q	ASHTON TATE	29	19	22	0.5	2.3
Q	ASK COMPUTER SYS INC	18	12	15.625	1.0	6.8
Q	AUTODESK INC	40	23	37.5	0.0	0.0
N	AUTO DATA PROCESSING	42	35	39	0.6	1.6
Q	BMC SOFTWARE INC	21	8	20.5	0.0	0.0
Q	BOOLE & BABBAGE INC	20	9	19.75	-0.3	-1.3
N	BUSINESSLAND INC	15	9	13	-0.6	-4.6
N	COMPUTER ASSOC INTL INC	44	24	40.875	-0.1	-0.3
Q	COMPUTER HORIZONS CORP	12	7	7.375	-0.1	-1.7
N	COMPUTER SCIENCES CORP	55	40	53.875	0.4	0.7
Q	CORPORATE SOFTWARE	15	9	13.75	-0.5	-3.5
Q	COMPUTER TASK GROUP INC	17	11	15	0.8	5.3
Q	COGNOS INC	9	5	6.25	-0.1	-2.0
Q	COMSHARE INC	35	16	34	2.0	6.3
N	CULLINET SOFTWARE INC	9	4	6.625	0.3	3.9
N	GENERAL MTRS (CLS E)	53	37	52.625	1.6	3.2
Q	HOGAN SYS INC	7	3	6.125	0.0	0.0
Q	INFORMIX CORP	25	7	10.25	-0.5	-4.7
Q	INTELLICORP INC	5	2	4.5	0.1	2.9
Q	KEANE INC	19	5	13.5	1.0	8.0
Q	LEGENT CORP	28	16	27	1.0	3.8
Q	LOTUS DEV CORP	27	15	26	0.5	2.0
Q	MANAGEMENT SCI AMER	14	6	10.625	0.0	0.0
Q	MICRO PRO INTL CORP	4	2	2.75	0.7	33.3
Q	MICROSOFT CORP	71	45	60.5	3.0	5.2
Q	NATIONAL DATA CORP	34	19	33.875	2.6	8.4
N	ON LINE SOFTWARE INTL INC	9	4	6.625	0.0	0.0
Q	ORACLE SYS CORP	31	15	30.5	1.8	6.1
N	PANSOPHIC SYS INC	18	12	14.5	-1.3	-7.9
Q	PHOENIX TECHNOLOGIES INC	19	12	13.75	-1.0	-6.8
Q	POLICY MGMT SYS CORP	31	21	29.75	-0.5	-1.7
Q	PROGRAMMING & SYS INC	19	11	18.5	0.0	0.0
Q	RABBIT SOFTWARE INC	3	1	1.125	0.0	2.8
Q	RELATIONAL TECHNOLOGY INC	21	9	9.5	-0.5	-5.0
N	REYNOLDS & REYNOLDS CO	34	17	33.5	0.8	2.3
Q	SEI CORP	22	16	16.625	0.1	0.8
Q	SHARED MED SYS CORP	23	14	17.75	-0.3	-1.4
Q	SAGE SOFTWARE INC	10	6	9.375	0.0	0.0
Q	SOFTWARE PUBG CORP	29	16	28	0.5	1.8
A	STERLING SOFTWARE INC	8	5	6.625	-0.1	-1.9
Q	SUNGARD DATA SYS INC	20	13	15.25	0.3	1.7
Q	SYSTEMATICS INC	37	26	34.75	-0.5	-1.4
N	SYSTEM CENTER INC	23	12	22	-0.3	-1.1
N	SYS. SOFT INC	26	9	25.25	0.5	2.0
	Semiconductors					
N	ADV MICRO DEVICES INC	17	7	10.375	1.3	13.7
N	ANALOG DEVICES INC	16	10	10.875	0.0	0.0
Q	ANALOGIC CORP	11	6	11.125	1.1	11.3
Q	CHIPS & TECHNOLOGIES INC	26	11	25	0.5	2.0
Q	INTEL CORP	37	19	32.5	0.8	2.4
Q	LSI LOGIC CORP	14	8	11.5	0.0	0.0
Q	MICRON TECHNOLOGY INC	26	15	24.5	-0.4	-1.5
N	MOTOROLA INC	57	36	56.375	4.9	9.5
N	NATL SEMICONDUCTOR	15	7	7.75	0.4	5.1
N	TEXAS INSTRS INC	51	35	44.5	0.8	1.7
A	WESTERN DIGITAL CORP	16	11	11.375	0.0	0.0
	Peripherals					
Q	ALLOY COMP	2	2	1.8125	-0.3	-14.7
N	AM INTL INC	6	4	5.875	-0.3	-4.1
Q	AST RESH INC	17	7	8.125	0.4	4.8
Q	AUTO TROL TECH CORP	6	4	5.125	0.1	2.5
Q	BANCTEC INC	14	8	13.375	0.1	0.9
Q	CIPHER DATA PRODS INC	11	8	8.5	0.0	0.0
A	COGNITRONICS CORP	5	2	3.75	-0.4	-9.1
Q	CONNOR PERIPHERALS	13	7	13.125	1.4	11.7
A	DATAPRODUCTS CORP	18	9	13.875	0.0	0.0
A	DATARAM CORP	10	7	9.5	0.8	8.6
N	EASTMAN KODAK CO	50	42	44.75	-0.5	-1.1
Q	E M C CORP MASS	10	3	4.125	0.0	0.0
Q	EMULEX CORP	12	6	10.375	-0.1	-1.2
Q	EVANS & SUTHERLAND	22	13	20.25	-1.5	-6.9
Q	ICOT CORP	4	2	2.25	-0.5	-18.2
Q	INTERLEAF INC	17	6	8.25	0.4	4.8
Q	IOMEGA CORP	5	2	2.625	0.0	0.0
Q	LEE DATA CORP	4	2	3.125	0.1	4.2
Q	MASSTOR SYS CORP	4	2	2	-0.1	-3.1
Q	MAXTOR CORP	14	6	10.5	-0.3	-2.3
Q	MICROPOLIS CORP	25	5	5.25	-1.0	-16.0
Q	MINISCRIBE CORP	14	1	2.063	0.3	13.8
N	MINNESOTA MNG & MFG CO	75	35	72.75	-1.4	-1.9
Q	PERSONAL COMPUTER PRODUCTS INC	6	4	4.438	0.0	0.0
Q	PRIAM CORP	2	1	0.688	-0.1	-8.3
Q	PRINTRONIX INC	11	7	8.25	0.3	3.1
N	QMS INC	10	6	7.625	-0.1	-1.6
Q	QUANTUM CORP	17	6	16.25	0.8	4.8
N	RECOGNITION EQUIP INC	12	6	7.625	0.3	3.4
Q	REXON INC	8	4	7.25	-0.3	-3.3
Q	SEAGATE TECHNOLOGY	19	7	14.25	0.8	5.6
N	STORAGE TECH CORP	18	15	16.125	-0.9	-5.1
Q	TANDON CORP	3	1	0.625	-0.1	-9.2
N	TEKTRONIX INC	27	19	23.5	0.0	0.0
Q	TELEVIDEO SYS INC	1	0	0.375	0.0	0.0
N	XEROX CORP	69	51	63.75	-1.9	-2.9
	Leasing Companies					
Q	AMPLICON INC	115	11	13.25	0.5	3.9
N	CAPITAL ASSOCIATES INTERNATIONAL INC	9	5	7.25	-0.4	-4.9
N	COMDISCO INC	28	19	27.25	0.6	2.3
Q	CONTINENTAL INFO SYS	7	0	0.563	-0.1	-18.2
Q	LDI CORPORATION	17	10	14.75	-0.3	-1.7
Q	PHOENIX AMERN INC	5	3	3.375	0.0	0.0
Q	SELECTERM INC	9	5	9.125	0.0	0.0

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Sun daze

Trading heats up as the month ends, and shares start June high

The stock market's last week in May wound up looking more like a day, starting with "Sun up" and ending with "Sun down." Sun Microsystems, Inc.'s early-week announcement of a promising joint venture with Toshiba Corp. was eclipsed by its subsequent disclosure of an imminent quarterly revenue and profit skid brought on by "management miscalculations." Sun closed Thursday at 20¾, down ⅜ of a point.

Elsewhere in the technology sector, prospects looked bright. Chasing the mid-May product rollout that powered its stock up 5 points, Compaq Computer Corp. signaled its growing European clout by announcing a $37 million plant expansion in the UK and watched its stock rocket 6¾ points. Compaq closed Thursday at 97¾. The sight of micro muscle flexing was not lost on software firm investors: Microsoft Corp. gained 1⅛ points to close Thursday at 60, while Ashton-Tate Corp. closed at 23¼, up 1 point.

IBM picked up a new president and another in its series of minority stakes in complementary tech companies; its stock picked up ½ a point, closing at 110. Digital Equipment Corp. closed up 1¼ points at 92⅜.

NELL MARGOLIS

CIO dealt new hand from reshuffled DEC

BY ALAN J. RYAN
CW STAFF

MAYNARD, Mass. — Longtime Digital Equipment Corp. veteran Belford E. Cross has stepped out of his post at the top of DEC's 6,000-employee information systems organization.

Cross, who for five years held the title of corporate manager for Digital Information Systems, will move into a yet-to-be-selected senior management position, according to DEC spokesman Jeff Gibson.

John Sims, vice-president of strategic resources, will take over Cross' duties as acting manager until a replacement is named, Gibson said.

According to a source within DEC, it is unusual for a ranking official to be moved prior to the naming of his successor. Cross could not be reached last week for comment.

Routine restructuring

Terry Shannon, director of the DEC Advisory Service at International Data Corp., a market research firm in Framingham, Mass., said that DEC "seems to have a restructuring every year," which generally takes place at the end of the fiscal year. "I would be hesitant to say this is a portent of anything extremely significant."

Cross, who called himself a proponent of electronic mail and electronic conferencing in an interview with *Computerworld* [CW, Nov. 28, 1988], said his concerns included maintaining security of both proprietary information and intellectual property and keeping the company on the technical edge.

Cross, who has a background in mechanical engineering, has worked in many senior positions in DEC's manufacturing operations during his 19 years with the company.

Prior to his move over to the systems area, Cross served as general manufacturing manager for distributed systems and general planning manager for general manufacturing. He has also been plant manager for DEC's Augusta, Maine, plant, which he helped to open in the early 1970s.

UB looses 16M-bit Token-Ring

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. last week revealed plans to deliver an IBM-compatible 16M bit/sec. Token-Ring that will one-up IBM by also running over inexpensive unshielded twisted-pair cable. But the product will not be available for a year.

UB also said it will manufacture its own switchable 4M/16M bit/sec. chip instead of going to Texas Instruments, Inc., which is the only other source for the chip other than IBM.

Third-party organizations that had announced plans to ship 16M bit/sec. Token-Ring products this spring said they cannot ship those products until TI starts supplying chips in volume. UB has no plans to market its chip.

A number of users angrily complained last November when IBM introduced a 16M bit/sec. network for only the more expensive shielded wire. UB President Ralph Ungermann said that his company decided to support both wiring types to address these concerns.

"Ordinarily, we would not make an announcement like this [concerning futures], except that our customers are demanding to know whether we'll run on unshielded twisted-pair," Ungermann said.

"They want to be absolutely assured that twisted-pair is a safe direction to go in," he explained.

Strike up the bandwidth

The postdated delivery schedule also reflects Ungermann's belief that 4M bit/sec. bandwidth is more than adequate to meet the needs of most Token-Ring users today.

Ungermann said many of his organization's users are in the process of wiring new buildings and establishing long-term — 10- to 15-year — network strategies. Some prefer unshielded twisted-pair, while others have no alternative because of space considerations in their buildings, Ungermann added.

In addition, UB's 16M bit/sec. Token-Ring will run over cabling systems from British Telecommunications PLC, AT&T and Southern New England Telephone Co.

The migration to 16M bit/ec. speed is expected to be slow, and there are some analysts who even question its usefulness.

"I wonder about the whole product niche myself," said Lee Doyle, an analyst with International Data Corp., a market research firm based in Framingham, Mass., noting that IBM was slow to come out with its 16M Token-Ring. "What applications are going to really benefit from 16M bit speed?" he asked, predicting that many users will wait for 100M bit/sec. Fiber Distributed Data Interface (FDDI)-based products. That standard is close to finalization, and related products are already on the market.

Market scramble

When it finally ships in the third quarter next year, UB's 16M bit/sec. product will likely find itself struggling for visibility among a crowd of competitive FDDI products.

UB's network reportedly will be fully integrated into its Access/One platform and will include bridges to FDDI, Ethernet and its 4M bit/sec. sibling.

There are no plans to provide a Manufacturing Automation Protocol-compatible bridge, according to the firm.

City Hall turns into the constituents' PEN pal

BY J. A. SAVAGE
CW STAFF

SANTA MONICA, CALIF. — For a growing number of residents here, city government is as far away as the living room.

When are the grunion running? Call up the recreation programs, beach subset. Can the brown glass go with the green glass in the recycling bins? Access the recycling menu. Want to give that city councillor a piece of your mind? Use electronic mail and expect an answer within 24 hours.

Since the Public Electronic Network (PEN) began in late February, nearly 1,000 users have been authorized to access the system. "Our goal was 500 users in the first year. We had 500 users in the first two weeks," said Ken Phillips, director of the city's information systems department.

It all started when council members were given portable computers in 1984, according to Phillips. Because they had access to city files, the idea of giving their constituents access began to take shape.

The city then undertook a survey and found that one-third of its households had personal computers. With that information, the idea gained momentum, except for one small problem: Santa Monica did not have the $350,000 to pay for it. By 1986, Phillips took his determination and the survey information to Hewlett-Packard Co., which was already a vendor with the city, and convinced it to donate the hardware, an HP 9000 Model 840 minicomputer supporting a version of Unix.

With the hardware in place, he persuaded Metasystems Design Group, Inc. of Washington, D.C., to donate its Caucus conferencing program software.

The Unix-based system was developed separately from the city's own system to prevent users from accessing nonpublic information such as police records. It also prevents hackers from disturbing other sensitive data such as tax assessments. The separate system also meant that Phillips had to find time and staff to develop it.

It took a year for the system to be built and integrated. "Three or four staff members had to learn Unix, a new programming language and Allbase [a method of developing databases]," Phillips said. Despite the learning curve, he said using Unix was key: "If successful, it would be easier to transfer the program to other agencies." He added that because it is character-based, it can communicate in all character-based modes.

One of the first problems Phillips encountered was teenagers who put "noncontent things" online. "But the system turned out to be self-policing. Other users got on and asked them to delete their responses," he said.

PEN's most often used feature is the library card catalog, followed by E-mail messages to City Hall. In addition to grunion-running dates and other lunar cycles, city activities, the latest drought information, city job availability, municipal bus schedules, police safety tips and crime statistics are also provided.

Hacker ring

CONTINUED FROM PAGE 1

and market numbers for credit cards and long-distance telephone service on voice-mail computers. "It is the first-ever federal investigation into voice-mail computer crime," said William Cook, assistant U.S. attorney for the Northern District of Illinois.

Eight hackers, using such handles as Little Silence, Kyrie, FBI Agent, Game Warden and Stingray, are suspected of defrauding as many as 20 corporations of "substantially more than $200,000" in goods and services, according to law enforcement officials. The final tally could go as high as $1.5 million, one Secret Service agent said.

The ringleader and only member of the group to be arrested thus far is an alleged hacker named Leslie Lynn Doucette, also known as Kyrie, said Fred Moore, a Secret Service agent in Chicago. Doucette, the 35-year-old mother of two children, is accused of illegally using voice-mail systems and stolen credit-card numbers and directing other hackers to buy money orders for her, among other crimes.

Using voice-mail systems, "she acted as a clearinghouse for stolen credit-card and telephone calling-card numbers," Cook said.

Law enforcement officials said that Doucette is suspected of being an active hacker for six or seven years and was once convicted of telecommunications fraud in Canada.

U.S. Department of Justice officials would not say how many more members of the group they intend to charge. Many are believed to be juveniles.

The Secret Service office in Chicago began its investigation in February after a real estate company in Rolling Meadows, Ill., told federal agents its voice-mail computer system had been repeatedly attacked by hackers.

Using a sophisticated device called a dialed-number recorder, federal agents tracked incoming calls to the computer system back to their subscribers. In March alone, seven hackers made 717 calls to the Rolling Meadows voice-message system, according to an affidavit filed by Secret Service agents.

Special agents executed search warrants in Georgia, Illinois, Massachusetts, Michigan, Ohio and California on May 24. At Doucette's apartment on the North Side of Chicago, authorities found books containing names of fellow hackers, long-distance telephone access numbers, Western Union documents and airline tickets for flights scheduled for the day after the search warrants were executed.

A grand jury investigation is under way, and indictments against Doucette and possibly other hackers are expected within a month, agents said.

1992

FROM PAGE 1

ers like him have to be prepared. As the date scheduled for the completion of the plan to dismantle prohibitive trade practices among the 12 member countries of the European Economic Community, Jan. 1, 1993 promises to be the start of a new era in European economic harmony.

Sterling Drug's Mattson

The years leading up to that changeover will also be fraught with immense challenges for IS, which has been charged with making these elaborate preparations come to life and completing the often difficult journey from drawing-board scribblings to boardroom reality.

"What we'll be looking at is essentially the United States of Europe, so obviously we're talking about some big changes," said Dan Cence, manager of international applications at Polaroid Corp. in Cambridge, Mass.

The chief business forces expected to shape information systems management for the 1992 switchover include a rearrangement of resources, the need for improved communications and the ability to handle expanded business throughout Europe.

In many cases, the starting gun in the race for change has already been fired. Thomas G. Labrecque, president of The Chase Manhattan Bank, said his firm is ready to take "full advantage" of Europe 1992 and has invested over $2 billion in technology that will help smooth the transition process. Similarly, Polaroid officials say plans have been under way for the last nine months.

Levi Strauss' Levandowski

The reason for this early start is that although the EC has targeted completion of the internal market to be the last day of 1992, most of the directives will be adopted by the end of this year. What have been organizational issues up until now are rapidly becoming systems issues.

The trouble is, IS managers are shooting at a moving target, one that includes networks, hardware, operating systems and software right down to the applications level.

"There is no serious linkage that says the potential of the single market will be X, therefore our business will be Y," Citicorp London Vice-President Derek Nicholas said. "There are many factors that have to be taken into account before you can say to the information technology manager, 'Go plan me a processing system that will deliver this product across frontiers at the lowest unit cost so that I can compete for market share.' "

Most systems managers agree that basic questions must first be answered: Who decides where and when changes should be made? What architectures will be used? Are data definitions the same within each segment of the company? Is centralization or decentralization the answer? Are systems adequate to handle a significant uptick in business? Are communications lines adequate?

One way to get a sense of how 1992 might look is by studying the impact on IS of the 1988 legislation that provided for borderless trade between the U.S. and Canada. At Sterling Drug, Mattson said his plans for cost-cutting and consolidating Sterling's Canadian affiliates with interconnection to key data centers in the U.S. are helping prepare the company for the changes Europe 1992 will bring.

A recent KPMG Peat Marwick survey reports that most executives feel that a single European market will not truly emerge until the mid-1990s, making planning for the first few years a struggle. "The really important years are from 1995 to 2005," Nicholas said. "That's when we'll see major activity."

Those changes may possibly bring fundamental corporate-wide shifts, and as the company bends and creaks, IS has to be there to make sure everything goes well. "The chief word is 'flexibility,' " said Steve Levandowski, vice-president of information resources for Levi Strauss & Co.'s international IS function. "We're doing things we are more sure about first, and as the story unfolds we may need to reprioritize."

While European systems managers need to confront these challenges now, U.S. systems managers face no such ultimatum. However, the work of their European counterparts has been a catalyst for many IS executives; of the 900 managers polled in the Peat Marwick survey, three-quarters said the threat of increased European competition is driving their preparations for 1992.

Although most of the executives queried said they see a unified Europe as a positive move, an additional 40% fear it may have a negative impact on the U.S. economy, saying that such a market might adopt a "Europe-first" attitude and could lock out foreign business. The EC "will have the power in their hands. They'll have the bat, the ball and the ballfield," one executive complained.

Despite these fears — perhaps because of them — most executives admit that plans are being hatched to take advantage of the changes. "We are aware of it and are concerned about it," said Dan Cavanagh, senior vice-president of information systems at Metropolitan Life Insurance Co., where IS operations in the UK and Spain have recently been reorganized under the same executive vice-president. Additionally, a 20-year systems veteran has been assigned to address the New York-based company's plans for 1992.

Met Life's Cavanagh

In other firms where the EC's changes are not playing a leading role in IS plans, they at least have secured a supporting part. "You don't forget the possibilities of 1992 when you're making your combinations or your acquisitions," said Vincent H. Swoyer, vice-president of corporate systems at Sara Lee Corp. in Chicago.

While Swoyer conceded that Sara Lee is establishing a presence in Europe through business combinations and acquisitions, "we have not promulgated a program that is aimed specifically at 1992 activities. That would be the extreme," he said.

Polaroid's Hyland

A recent report by the London Business School stated that Swoyer's optimistic-but-cautious view may be right on the money. The report concluded that much of the 1992 discussions are based on hype and that the relaxed restrictions may not translate into increased trading or a vast all-Europe market. Language barriers, national brand loyalties and cultural and economic differences will not disappear with the stroke of a pen, the report said.

Among those who believe opportunities await, centralization is often a paramount objective. At Levi Strauss, formerly decentralized European operating units will soon be joined like spokes on a wheel. "The structure of our business in Europe now is geographically oriented, with each country run like a separate business," Levandowski said. "We are hoping to switch that to a single European division."

Sara Lee's Swoyer

Among Levandowski's plans are establishing EDI links among his firm's European accounts, creating Levi Strauss-only stores and introducing point-of-sale technology enabling the firm to keep a close eye on customer purchases and facilitate production planning.

Others express similar views. "This is a way for us to move even closer toward systems commonality" between U.S. and European operations, said Al Hyland, director of worldwide systems at Polaroid. "We would like to provide a common technical approach — a common platform, common systems software for the business aspects — and we hope to construct and develop on that same platform individual pieces that fit individual countries."

Sales, marketing and distribution promise to be other key areas affected. Many executives say key strategies will include expanded marketing and joint ventures with European companies. Colgate-Palmolive Co. already has begun to centralize manufacturing while standardizing packaging and product formulas. Philip Morris International has set up localized marketing and sales and is centralizing its computing efforts.

These changes will in turn ripple through the organization. Hyland said Polaroid is considering pricing on an all-Europe basis. This system would include centralized files, on-line price quoting and pricing independent of shipping location. The ability to reduce paperwork, which has hobbled cross-border flows, will mean greater communications, Hyland added.

However elaborate the system changes, the central artery of the IS network will remain a crackerjack telecommunications system. Alan Kammen, an analyst at Lexington, Mass.-based research firm Nolan, Norton & Co., estimates that by the year 2000, 60% of all employment opportunities in Europe will rely on the ability to use voice, data and imaging technology. To prepare for that, the EC is working toward revamping communications within its borders.

To some, this movement will present the most crucial challenge. "Trillions of dollars are being spent to modernize telecommunications," Nicholas said. "But if the regulations and usage conditions of those telecommunications facilities remain as in the past, then all that money will have been wasted."

The adjustments may also change the telecommunications function. "We're not just talking about interfacing anymore," Cence said. "We're going to need to consolidate our information much more quickly. There will be a much stronger need for good, solid communications, especially when making the organizational transitions to address the needs of 1992."

IDG News Service correspondent Amiel Kornel contributed to this report.

Philip Morris: A case study

As director of technology at Philip Morris International, Phil Friedman says he is sure the cigarette giant is moving the right way to take advantage of the opportunities 1992 will provide.

Other companies may be scrambling to get into the 1992 mind-set, Friedman said: "We're in position for 1992 based on our culture and our business direction."

Philip Morris' Friedman

Philip Morris already has centralized manufacturing management, production planning, logistics and inventory management, Friedman said. However, it does not make good business sense to centralize all of the cigarette factory operations. There are five plants in West Germany, the Netherlands, Belgium and Switzerland.

"You make the products where you have raw materials, waterways and other forms of transportation. But distribution should be centralized through a core team in the home office, wherever that might be," Friedman said.

The structure Philip Morris has in place allows the company to "respond effectively to markets and yet be responsive to local needs," according to Friedman. That structure includes moving to common systems and applications across the company's different business requirements, he said. "Part of that is 1992, and part of it is just our normal business plan."

Other preparatory tactics include aiming for systems commonality with the firm's U.S. operations and centralizing the company's European information systems organization.

ALAN J. RYAN

Renault also braces for change

IN PERSON

When the 12-nation European Community unites for business purposes in 1992, non-European companies will have an opportunity to ease marketing problems and improve systems compatibility there. But European-based companies will also be affected.

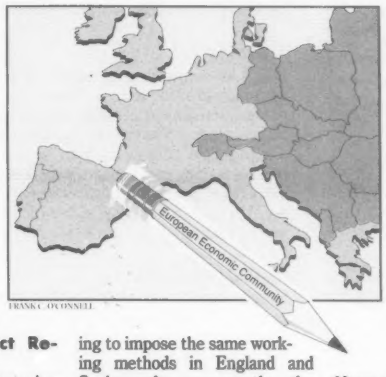
IDG News Service European bureau correspondent Amiel Kornel recently interviewed Jean-Paul Meriau, director of organization and computing at Renault Vehicules Industrielles. Renault, headquartered in Lyon, is a leading European manufacturer of trucks, buses, fire engines and military vehicles.

How will EC plans to open the market by 1993 affect Renault?

Renault has manufacturing plants in France, Spain and England. We are expecting a simplification of the movement of merchandise between the different factories.

What impact do you expect this simplification of cross-border administrative procedures to have on IS at Renault?

Currently, we have a single computing site for all the industrial activities in France and different computing structures for England and Spain. We are now trying to impose the same working methods in England and Spain and, consequently, the same computing system.



FRANK C. O'CONNELL

What would the common approach entail?

It implies using the same applications, having the same organization, the same working methods and the same computer systems. That means using the same applications in France, Spain and England. For the user, it must be transparent.

Is the EC project of 1992 pushing you to standardize your applications?

Yes. We make products that roll throughout Europe and that need more and more to have the same specifications in all the European countries. Secondly, we need to offer sales and maintenance services that are much more efficient than even those we have today. It's certain that 1992 plays a role in this. We know our market is much more Europe than just France.

How else will the unified market change your approach to computing?

Instead of having different computer systems, we can have a company with a single computing structure. If we have a company that is less cumbersome, we can have a computing approach that is less cumbersome.

What impact will 1992 have on your computer procurement costs?

There is already a terrible price war between vendors. I think 1992 will accentuate that.

Which vendors stand to benefit the most from this change?

Among users, 1992 will lead to the concentration of bigger and bigger companies. This process of concentration favors the creation of large, central computer centers. This, in turn, favors IBM since it has such a strong position at the high end.

Rhyme and reason

For years, businessmen working in Europe needed to negotiate a web of country-specific economic and industrial guidelines. With each border came a different package of regulations, some of which had been specifically created to inhibit outside trade.

The Single European Act of 1986 promises to sponge away these inequities and make each country an equal partner. If successful, the move would create what is in essence the world's largest trading bloc — a $4 trillion market serving 325 million people.

Excitement about the changes has grown tremendously and is now reaching these shores in earnest. A recent survey by the Bank of Boston reported that nearly 60% of American companies with no presence in Europe say they plan to enter it as a result of the creation of the unified market.

JAMES DALY

Exact change

The Single European Act amendment to the European Community's charter is intended to lead to the following:

- Removal of all physical barriers that necessitate border controls, such as duplicative customs documents and residency restrictions
- Establishment of common networking, industrial and telecommunications standards
- Elimination of restrictions on trade and capital movements
- Harmonization of technology copyright law, including the creation of an EC trademark throughout the community
- Opening of government procurement practices
- Elimination of fiscal barriers, including the harmonization of value-added and excise tax rates

CW CHART

GE blasts barriers with unified network plan

BY ROBERT MORAN
and ELISABETH HORWITT
CW STAFF

NEW YORK — Positioning itself for the planned toppling of European trade and communications barriers in 1992, General Electric Co. last week announced plans to link corporate sites worldwide into one homogeneous communications system.

The network, which will eventually connect 25 countries, "is the first time AT&T and foreign carriers got together to create a [private] network to provide end-to-end voice, data and video services for a single customer, covering six continents," said Stanley Welland, GE's manager of corporate telecommunications.

AT&T, France Telecom and British Telecom will work with other telephone companies to set up a private-line network that will eventually allow users at any GE site around the world to communicate with any other using the same seven-digit dialing plan and communications protocols, according to AT&T manager Richard Wallerstein. Managers will not have to learn new dialing systems, Wallerstein said, so GE will be able to "deploy people and resources in the most efficient way possible without creating islands of information," he added.

The network "has very much to do with the changing environment" in Europe, in which trade and communications barriers began to come down long before 1992, Welland said.

GE chose to set up a private leased-line network, as opposed to ordering data, voice and video services piecemeal from various carriers, because it enabled the manufacturer to serve its users more flexibly, he said: "We've been living with a patchwork quilt for a long time, as have other American corporations."

A private network allows GE to allocate bandwidth dynamically, Welland said; for example, an unused video channel can be reallocated to serve a sudden increase in data traffic.

The company will manage the international network from the same network control center in Princeton, N.J., that handles its domestic network, Welland said.

Three-company contract

GE signed a five-year agreement with AT&T, British Telecom and France Telecom for an undisclosed amount to build the network, which will use terrestrial digital facilities and occupy approximately 2% of the trans-Atlantic fiber-optic cable known as TAT-8. Backup for TAT-8 will be provided by satellite transmission from Comsat Technology Products, Inc.

The contract "would amount to multimillions of dollars annually," Welland said. He added that the selection was not based on a competitive bid because "when you go out for a competitive bid, you don't have a partner." The contract is for services only; Welland would not comment on which vendors might be tapped for communications equipment, other than to confirm that the equipment will "have the potential for migrating to ISDN."

In the project's first phase, the so-called partners will link GE's U.S. offices with offices in Canada, the UK, France, the Netherlands, Belgium, West Germany, Switzerland, Italy, Ireland and Spain. The company said the project will be completed by the end of this year.

The second and third phases will enfold the Far East, Australia, the Middle East and South America into the network and are slated for early-1990 completion. The network is earmarked as a strategic piece in the broadening of the firm's customer-service offerings. Welland said that GE will be able, for example, to set up an international videoconference in roughly one hour — about the time it takes to do so domestically.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.

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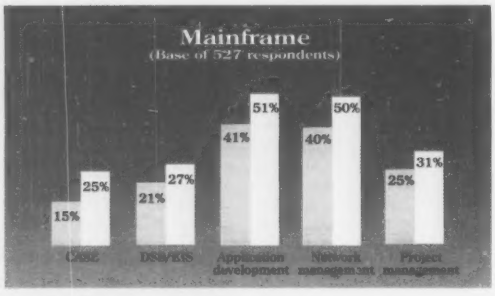
TRENDS

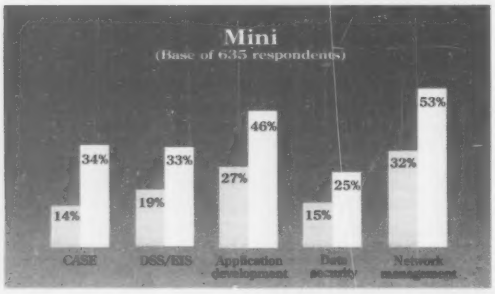
Software survey

A look at the five fastest growing software technologies within three hardware platforms

Percent of companies with software installed
□ 1988 □ 1989 (projected)

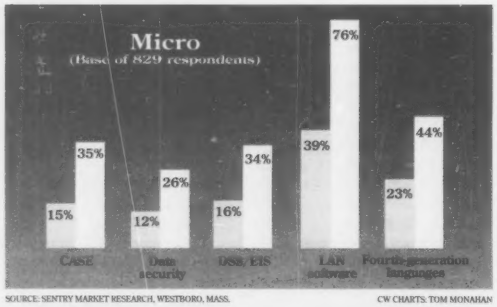
CASE emerges as *No. 1 on all platforms, growing 65% among mainframe environments. Decision support and executive information systems are No. 2.*





Minicomputer *software stars closely reflect mainframe favorites.*

Security of PCs *has become a major issue; security software is expected to grow 120% this year.*



SOURCE: SENTRY MARKET RESEARCH, WESTBORO, MASS. CW CHARTS: TOM MONAHAN

COMING UP

The Media Lab at MIT is renowned for its innovative look at the future of technology, but the lab is not without controversy. As the recipient of large amounts of money and attention from Japanese concerns as well as U.S. industry, the laboratory must work hard to maintain a critical balance and clear focus. See Page 1 next week.

Steven Gold says he's never met an application that couldn't be downsized. See why in next week's Executive Report.

If executives can learn how to recognize who's who in the data center, they'll soon be able to get down to the business of grinding out that code. Are you the martyr, the meeter or, perhaps, the know-it-all? On the Viewpoint page next week, Michael Cohn provides an amusing look at some of the types that populate the data center.

INSIDE LINES

From the horse's mouth

A DEC spokesman confirmed what you read here last week. On June 13, DEC will announce Vida DB2, software that ties DEC's RDB relational database management system to IBM's DB2. DEC will also unveil new versions of five or six software products along with computer-aided software engineering tools developed by DEC and independent software vendors. One Vida DB2 beta user said that despite some minor problems in the CICS environment, the product has been working well. The user is linking a VAX-based market analysis system to an order and billing system on an IBM mainframe.

Getting DEC'd?

DEC's oft-rumored reorganization is about to become reality, according to inside sources. A major announcement within the company on the shifting of power and resources is expected to be made today. Sources say Ken Olsen is looking for swift action to control burgeoning costs. Stay tuned. . . . Meanwhile, bloated staffing continues to be a major issue, and a "golden handshake" policy is reportedly ready to be implemented. Sources say some employees will receive a very lucrative severance package — to take involuntary early retirement.

Mainline MSA

Management Science America will continue to make news next week with a product announcement. The company will vie for the attention of the executive suite with an executive information system designed for use with its financial applications. The product is the result of a joint development agreement with Comshare in Ann Arbor, Mich.

Mixed signals

At a Boston press conference two weeks ago, Bill Kay, Hewlett-Packard's workstation general manager, said emphatically that HP would not lay off employees at Apollo as a result of the acquisition of that company. But this week, an HP spokesman confirmed that there would indeed be layoffs and that some Apollo employees will be given the opportunity to take jobs at HP divisions throughout the country.

Javelin all over?

Sources close to Lotus report an interesting development. The firm is currently developing a financial modeling package that runs under the OS/2 Presentation Manager. Ironically, by dispensing with its total rows and columns orientation, the product bears some resemblance to Javelin, sources said.

About time for a detention?

Ashton-Tate is well entrenched within the ranks of the late and shows no signs of giving up this dubious honor. The firm is already late with Dbase IV 1.1, a product that fixes bugs and talks to SQL Server. Those waiting for 1.1 to show might as well take the summer off. Word from Ashton-Tate is that the third quarter will be the charm, as previously reported here.

What goes on behind closed doors

The fact that trading volume on stocks of Sun Microsystems was up sharply in the hours before it announced that quarterly earnings would be off has caused whispering in the ranks. Although Sun broke the news after the stock market closed last Thursday, its issues were one of the hottest on the NASDAQ and even fell $1.25 in an up market. One analyst noted that the coincidence "would indicate that someone knew and acted upon" the news in advance.

Alas, poor Sydney

Let us mourn the passing of Sydney Development Corp., a small but feisty Open Systems Interconnect software vendor that recently declared bankruptcy. This leaves Sydney's archrival, Retix, with a fairly open field in the PC LAN-based X.400 software arena. Industry scuttlebutt has it that Sydney was doing well in electronic mail but had diversified into too many ill-considered projects.

Sun's exhibiting some real grown-up tendencies in blaming its internal systems for plummeting financials. Geez. Let us know if you've heard any good ones lately. Call Pete Bartolik on the hotline at 1-800-434-6474.

COMPUTERWORLD

SECTION TWO
OF COMPUTERWORLD
JUNE 5, 1989

focus on

Integration

- Cover story: Changing the way business does business
- Exclusive PC LAN security survey
- Integration visionaries
- Beating the budget blues
- Strategic alliances: A winning combination
- The OS/2 migration dilemma

Chester Jones of Shell Oil

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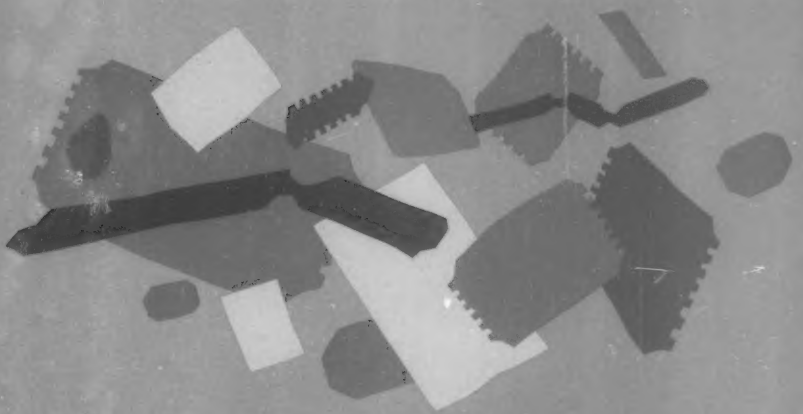
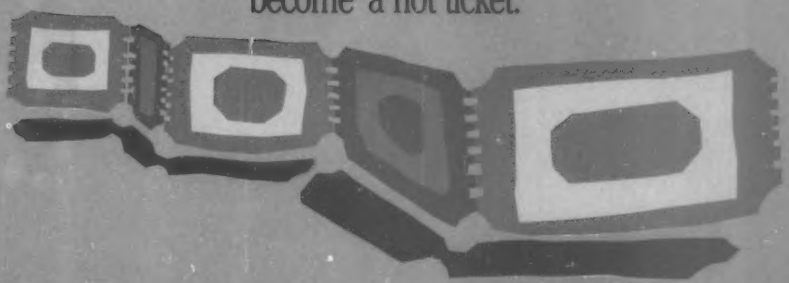


become a hot ticket.



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MANAGING

IS people with a vision. Page 34.

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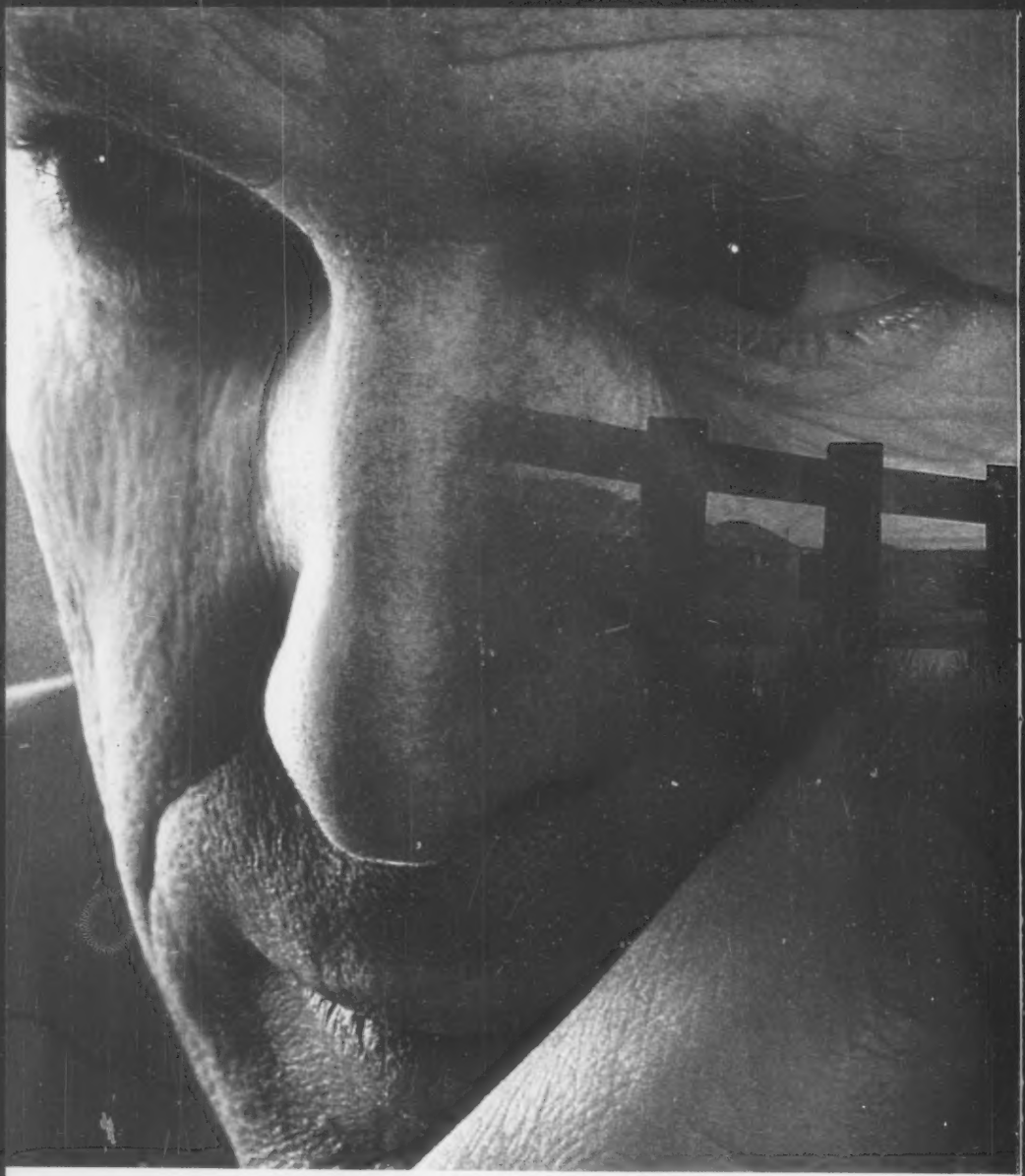

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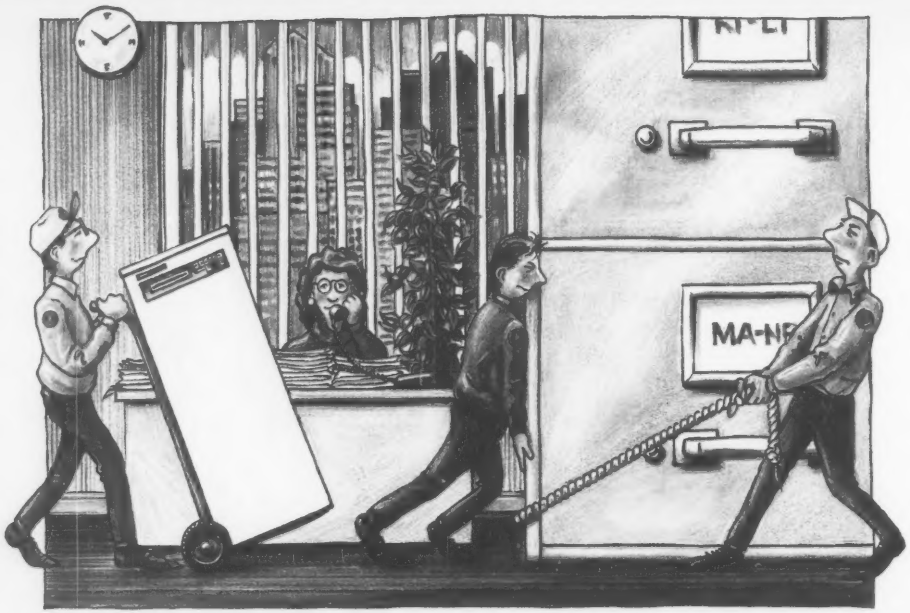

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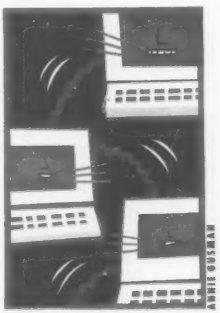
The right mix of business and technology vision

Technology planning and business planning have been isolated from each other for too long. We must ask ourselves where we can make a difference in a business with value-added functions and then follow through with computing resources. We often forget that technology is only a means to an end.

This was really brought home to me during a talk by John Hammitt, new VP of IS at United Technologies, at a recent Society of Information Managers meeting in Boston. He told the audience that companies have spent years institutionalizing old ways of thinking and work methods. His point was that we can't get to where we need to go by speeding things up; we need to see the future in new ways.



We need to see the future in new ways.

Leadership is driven by having a vision of that future. Vision is a word you hear a lot these days. Everyone would like to be a visionary, but what does it take to be considered one by your peers and employers? Senior writer Helen Pike talked to a number of visionaries and discovered that no two were alike and none had used the same formula to achieve integration in their companies.

Today's competition demands vision. Our cover story on "Business imperatives" illustrates that innovative use of technology is enabling changes in the way business does business. Writer Mark Breibart discovers that real integration successes are few and far between, but once gained, the rewards are worthwhile. And that's what is keeping innovative companies struggling to find that right mix of technology and vision in their companies.

But creative solutions don't have to occur just within one company. Senior editor Stan Kolodziej analyzes a new trend — strategic alliances — in which companies join together on a specific project for mutual benefit.

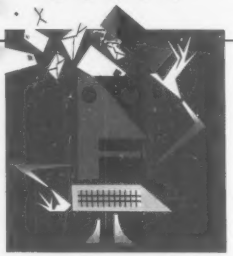
Read about this alternative to mergers and acquisitions and decide for yourself the pros and cons of merging data and resources for the short term.

What stories would you like to see?

Send your ideas and comments to me, Ann Dooley, Editor, *Computerworld Focus on Integration*, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701. Or call me at 1-800-343-6474 or try our bulletin board at 508-626-0165.

Ann Dooley

letters



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Subliminal suggestion

With respect to Stan Kolodziej's article, "A question of bias," in the April 3 issue of *Computerworld Focus on Integration*:

As a consultant, I have frequent opportunities to watch system integration firms and vendor personnel prepare "vendor independent" recommendations for solving a user problem.

As a rule, I have been impressed with the technical skills and good intentions of the people assigned to these tasks. They mean to develop vendor-independent ideas and generally try their level best to do just that.

The bias, however, shows up on a more subtle — perhaps a subconscious — level. The concepts they set forth in their solutions never, never involve approaches that their employer does not promote or products that their employer could not provide.

This is only natural. A Digital employee who has seen central minicomputers with dumb terminals solve a wide range of work group computing problems naturally thinks in terms of a central minicomputer to solve the next. Because the central mini undoubtedly can solve it, this person is not motivated to consider whether single-user micros on a local-area network might solve it better. The proposal that results is vendor-independent in that the central mini need not be from Digital, but it will be biased nonetheless. The same holds for relational vs. network databases, Centrex vs. private branch exchanges or Prolog vs. LISP. The nod will always go to the employer's product line.

Independent system integration firms are less subject to this form of bias, but it exists there as well. The backgrounds of these firms and their staffs tend to be in traditional mainframe applications. They often deal with deficiencies in other areas by forming strategic alliances with specialized suppliers. The approaches favored by these partners dominate the proposals of independent system integration firms. In a way, this form of bias is even worse than the first. The vendor employee generally has the technical background to appreciate the merits of alternate approaches but is culturally biased against them. The employee of the independent systems integration firm may lack even the technical ability to evaluate alternate approaches to those that a strategic partner offers.

Users can protect themselves against this form of bias by educating themselves on the major options in each area of importance. For example, they can ask the person who suggests a central mini, "Did you consider micros on a LAN for this application?" If the mini can be defended objectively against informed arguments, well and good. If the vendor employee tries to dance around the question, bias has been at work.

EFREM G. MALLACH
EFREM G. MALLACH ASSOCIATES
NEEDHAM, MASS.

Toning down the CASE fervor

Just a note to say I really appreciated Stan Kolodziej's article "Caseing the joint" in the April issue of *Computerworld Focus on Integration*. The computer-aided software engineering area is close to my heart, and it was a relief to see someone come out and say a few things on a topic I have been watching for quite some time.

Interesting is what Suzanne Niedzielska points out: "The technology cannot yet deliver a solution that fits every systems project team or application." Unfortunately, vendors and proselytes of the CASE market have sometimes been overzealous in their claims of what their products or the industry as a whole can deliver. Hopefully, with the amount of attention and study going on around the country, these individuals will reevaluate their claims and see more clearly the direction in which the market is going as well as see that what is good for one may not be good for another.

CARL HANLON
CHARLOTTE, N.C.

A spirit of cooperation

I am a systems professional who has devoted over 15 years to the business, art and science of MIS design and implementation before I joined the Dormitory Authority of New York some five years ago. As such, I feel compelled to register my strong protest with respect to the presentation content of the article "It's business as (un)usual for Big Apple CIO" written by Mark Breibart in the Achievers section of the April 3 issue of *Computerworld Focus on Integration*.

On behalf of many of the management and staff here at the Dormitory Authority — who must truly be recognized as the new MIS "achievers" — I regard this article as slanted, myopic, misleading and not reflecting some of the major reasons for the dormitory's MIS turnaround.

Technology was an important part, but only one part of a multidimensional approach to the modernization and integration of our operations. Technology was and is a vital tool, but our new management practices and staff productivity were also very much critical factors in our recovery. In a sense, there are many CIOs here

at the Dormitory Authority, not just one. Among other duties, it was Ron Wooldridge's responsibility to coordinate the ideas of all of these "CIOs" with the appropriate technology, a job for which the Dormitory Authority will be in his debt for many years.

Contrary to a statement in the article, there were many information systems existent before the new management team arrived, albeit relatively basic and totally nonintegrated. Developing an integrated MIS was a vision created and cultivated by several members of the Dormitory Authority's top management, although certain aspects of technology coordination were assumed and very successfully carried out by Ron Wooldridge.

Our IS plan was indeed a tall order for scores of our managers and staff who were responsible for designing, implementing and converting our new MIS (all of which was monitored by Ron most capably) while performing their day-to-day functional duties.

The MIS improvement at the Dormitory Authority was the direct result of the leadership and hard work of many of our managers and employees (devoting tens of thousands of hours to this effort) and not the product of just a few of our staff, as Mr. Breibart's article strongly suggests.

Further, it must be noted that it is a distortion to state that organizational autonomy had contributed to the authority's downfall. Our organization suffered a setback in operations but never a defeat. There were and there are too many strong factors present throughout the fabric of the Dormitory Authority to allow a downfall, then and now.

It is important to note that I regard Ron Wooldridge as a personal friend of mine and a professional colleague for whom I have the highest respect. It is even more important to note that I believe Ron's input to Mr. Breibart's article did not contribute to its slanted and unbalanced presentation. I believe his version of the MIS development at the Dormitory Authority more closely reflects the corporate team approach to our MIS success stressed in this letter.

May I respectfully suggest that more balanced presentations and broader viewpoints of your materials should be obtained through more thorough research if you are to truly achieve your objectives of providing not only answers in your publication, but answers that are both accurate and complete and, thereby, more helpful to your readers.

DANIEL J. DUGAN
DEPUTY EXECUTIVE DIRECTOR
FINANCE AND TREASURER
DORMITORY AUTHORITY OF NEW YORK
DELMAR, N.Y.

[The intent of our Achievers column is to highlight an IS manager who has solved an organizational or technical problem and to show other readers how it was accomplished. We understand that any solution is rarely the work of one person working alone and that teamwork and coordination has to be involved — something we advocate strongly in our pages. We're sorry if anyone at the Dormitory Authority felt excluded. — *Ed.*]

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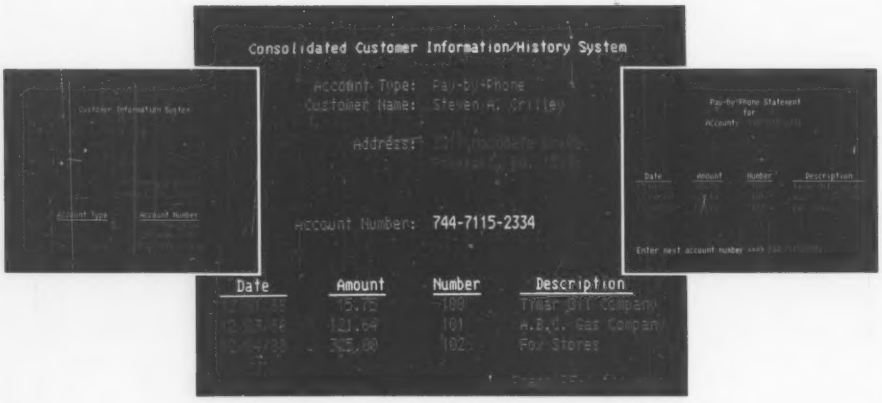

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Circle Reader Service Number 7

INTEGRATION ISSUES SPUR NEW AREAS OF LEGAL PURSUIT

A Marvin Mitchelson to take the case of dis-integration palimony?

A Clarence Darrow to deal with evolutionary interoperability?

An F. Lee Bailey to defend the freedom of file transfers on a heterogeneous network?

An unhonored systems integration contract might not require lofty oratory courtroom skills, but there is work out there for lawyers as integration increasingly moves out of the public sector and into the commercial arena.

As more vendors get tied together in a customer's shop, the lines of responsibility and, therefore, possible blame, can get blurred. So, if an information systems manager thinks he can sign an integration contract without a lawyer, he might want to think again.

"People don't pay attention to the details," observes James Kurz, a trial lawyer who says he is more likely to get calls after a contract has gone awry than while it is being negotiated.

When drawing up a systems integration contract, an information systems manager should be looking for a single point of contact if something goes wrong, says Hurz, who is partner in the law firm of Kurz & Koch in Washington, D.C.

Also, "Contracts now have arbitration clauses, so you don't have to go to court," thus saving time and money, Kurz says.

The lawyer for a systems integrator should try to draw up "objectively defined written specifications," says Helene Stewart, a lawyer at Oracle Complex Systems Corp., an Oracle Corp. subsidiary that handles products and services in the government market. "That way, everyone has the same image in his mind."

Stewart adds that the goal of the contract drafter is to have a contract that is clear enough that an independent third party can understand what the contract means.

ROBMAND COUSINEAU

As more vendors get tied together in a shop, the lines of responsibility and, therefore, blame, can get blurred.

In sum, integration contracts should give the IS manager peace of mind, Stewart says. They should use clear language for estimating functional needs and state exactly what will be delivered and time periods for performance. — By Helen Pike

NOTED

BELLCORE HAS COMMITTED $1 MILLION TO CARNEGIE-MELLON UNIVERSITY'S GRADUATE-LEVEL PROGRAMS IN INFORMATION NETWORKING, SLATED TO BEGIN IN FALL 1989.

EVERY PROTOCOL HAS ITS DAY

The technology's nothing new, but suddenly, remote procedure calls (RPC) are the darlings of every network vendor's product portfolio.

RPCs are network protocols that enable pieces of software applications to run simultaneously in a local-area network environment on a variety of different processors and hardware platforms. In the age of integration, LANs, distributed processing and the push to increase network throughput, RPCs are suddenly a valuable asset.

Some vendors and analysts even see RPCs as the important vehicle in launching the next evolution of corporate networking: distributed computing.

Some even see remote procedure calls as the important vehicle in launching distributed computing.

RPCs represent a quantum leap forward because they provide the tools to build networking strengths directly into new software applications. They even have the ability to break up separate parts of an application and have each piece run on a separate machine on any part of the network or networks. RPCs can also encode across multivendor networks.

John F. Slitz, vice-president of marketing and business development at Netwise, Inc., a Boulder, Colo., developer of RPC tools, says RPCs work on two levels.

At the base level, Slitz explains, RPCs take local calls and provide programming code across processors.

"At a higher level, the RPC mechanism is a kernel on which to build major client/server applications," he says. "It becomes a high-level procedural interface that generates major application code across networks." — By Stan Kolodziej

■ COMMUNICATIONS INNOVATORS

FARMERS REAP THE BENEFITS OF INTEGRATED DATA DELIVERY

In the nation's agricultural industry, a prolonged drought is aggravating the conditions in which farmers must conduct their business. But in Illinois, farm managers are fighting back using integrated technology.

They have set up a statewide communications system that brings together weather, crop futures and financial data and sends it via a television satellite that, in turn, delivers it as a radio signal to 3,500 farms in the state.

"The ongoing crisis in agriculture fueled the communications need," explains Kent Karraker, general manager of communications systems for the Illinois Farm Bureau in Bloomington, a nonprofit farming cooperative providing a variety of services to farmers, from insurance to legislative support to information services.

• Karraker (left) says the communications system presents farmers with weather reports from the Midwest Climate Center at the University of Illinois, national commodity prices from New York and the news wire from the U.S. Department of Agriculture.

Desiring information sooner than the previous week's news in a weekly print format, farmers told the bureau in 1975 they wanted more timely news on agriculture, weather and commodities, Karraker says. So the bureau's IS department set about designing an integrated data and delivery service.

Today, the farm bureau uses a Wang Laboratories, Inc. 7310 minicomputer as a hub for coordinating data and delivery activities. The data is transmitted from Bloomington along dedicated lines to a satellite uplink in Chicago. From the satellite, the information is sent to 18 radio stations throughout Illinois.

With antennae on their roofs, farmers receive a special FM signal that transmits up to 64 electronic pages of information into dumb terminals located in their offices.

Participating farm bureau members have the option of a one-time $800 purchase of the receiving and terminal equipment or a rental arrangement that requires a $90 initiation fee and a $200 yearly charge. In either case, the information is free. — By Helen Pike

[The Illinois Farm Bureau is a finalist in the *Computerworld Smithsonian Awards* competition, which recognizes outstanding technological contributions to society. — *Ed.*]

EDS GOES AFTER COMMERCIAL MARKET

Electronic Data Systems Corp. (EDS) has ambition as big as its home state of Texas.

This systems integration subsidiary of General Motors Corp. grabbed headlines recently by its joint acquisition of National Advanced Systems with Japanese titan Hitachi Ltd. The move gives government contractor EDS low-cost mainframes on which to develop applications and thereby make an aggressive bid for a piece of the commercial market.

The strategy from EDS' Dallas headquarters concerns leveraging integration expertise gained from its GM work with revenue other than from the Detroit automotive giant.

Even with a busy GM schedule that by the end of the last fiscal year accounted for 59% of its $4.84 billion in revenue, EDS has managed to grow its non-GM business by 30%.

"People recognize that communications and computing are merging," says Stuart Reeves, senior vice-president in charge of EDS' government systems group. EDS wants to be known as a supplier of both.

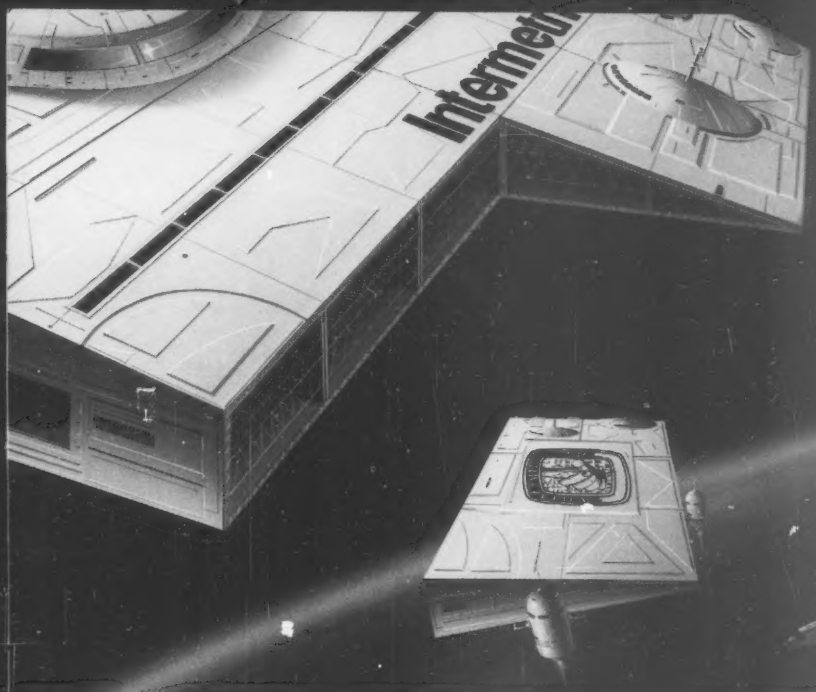
To that end, EDS this year alone has done the following:

• Upped its stake in the electronic funds transfer (EFT) market by buying Automatic Data Processing, Inc.'s EFT service. This purchase follows last summer's acquisition of Mtech Co., the EFT and DP operation of Mcorp, a faltering savings and loan.

• Signed a cooperative marketing agreement with Hewlett-Packard Co. to bid jointly on proposals for which HP hardware, EDS software and project management services from both companies can be integrated.

• Bagged a 10-year contract valued at $300 million to perform the IS operations of the Meritor Financial Group, the nation's seventh largest thrift. The pact includes the purchase of $25 million worth of Meritor's DP and voice and data communications equipment.

• Opened a $1 billion Information Management Center in Plano, Texas, responsible for 24-hour operation of EDS' 21 information processing centers and EDSnet, its global network boasting half a million attached devices. — By Helen Pike



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■ ON THE CONTRARY

ARE EXECUTIVE SYSTEMS WORTHWHILE?

AT ISSUE: Executive information systems. Executive support systems. The concept goes by various names, but it has a single goal: Delivering strategic information to the executive suite. Nice idea, but does it work? The debate still rages . . .

PRO: LLOYD BELCHER

Typically, an executive information system (EIS), like other computer systems, is viewed as a new process. Yet every executive has some form of information infrastructure whether or not he has ever seen a computer. This structure may be a series of telephone calls, memos, presentations or requests from an executive assistant.

So, rather than thinking of an EIS as some new process, consider it an improvement to the existing process. This concept, driven by a business application orientation and coupled with today's technology, can yield amazing results.

But what is an EIS, and what does it do? An EIS is a system that allows corporate data from various sources to be converted into meaningful information, accurately, quickly and securely. It may be very small, with no more than 20 numbers, or it may consist of thousands of numbers, graphs and text.

Who should have an EIS? An EIS is for any executive with a desire to improve his ability to use information as a strategic resource.

How difficult is it to get up and running? It is easy for a small amount of information and increasingly difficult as the information base is expanded.

Should it be widely used? Practically without exception, today's computer technology can and should be used to improve or enhance the existing executive information process.

What are its benefits? The benefits are as broad as the opportunities to deliver better information to the executive suite. A new delivery system can enhance the information, and new ideas for presenting strategic information will grow from the partnership of business needs and technology.

An EIS can be any size. Do not be misled by those who would have you believe an EIS has to be an expensive system complete with a team of analysts and computer jocks.

•**Belcher (left) is the coordinator of business environment and executive information in the planning and analysis department at Conoco, Inc., an oil company located in Houston.**

JOHN OWENS

•**De Long (right) is a research associate at Harvard Business School and co-author with John Rockart of *Executive Support Systems: The Emergence of Top Management Computer Use.***

CON: DAVID DE LONG

Not all attempts at bringing information technology to the executive suite have been fabulous successes. In fact, at least half of the attempts to implement an executive support system (ESS) end in failure or, at best, provide users with slightly more value than an extra coat hook.

Although the payoffs can be tremendous, developing an effective ESS is difficult. The most common reasons for failure are either that the executive does not see any benefits in using a computer or fails to realize the time and energy necessary to create a system of real value. William Smithburg, chairman and chief executive officer at Quaker Oats Co., says it took him three years to develop a database that he considered useful.

Maybe that's extreme, but unless an ESS developer has an executive sponsor willing to expend his political capital in twisting arms to make the system a reality, he should focus his resources somewhere else. It's usually a waste of time (and money) to try to sell top management an ESS.

In other cases, the executive casually says, "Get me a computer," thinking the project, like most others, can be delegated. In this situation, ESS developers often become intimidated and fret about keeping the "big boss" happy, forgetting that they have a responsibility to educate — not sell — top management on its role in creating an effective ESS. The development of senior management systems is something that frequently is delegated to systems analysts. But the political stakes are too high and the executive's information needs too personal — and critical — to give the project away. When this happens, everyone loses.

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Circle Reader Service Number 9

■ IS EDUCATION

POSTGRADUATE PROGRAMS TARGETED AT IS OFFER OPTION TO TRADITIONAL MBA CURRICULUM

An MBA with a concentration in information systems remains the popular, though not the only, choice when it comes to an IS business education.

But can MBA programs, IS twist or not, prepare students to deal with real-world technical issues such as integration? According to Jim Wetherbe, they certainly can.

Wetherbe, a professor at the University of Minnesota's Carlson School of Management, says the MBA project team approach at Carlson is one way students get a feel for how businesses work.

Team effort

The teams are made up of graduate students concentrating in various fields like marketing, finance, IS and so on. These teams are assigned to companies to solve business problems. If the problem happens to be an integration one, the IS participant must draw on his technical skills, as well as his knowledge of business strategies, to find a solution. But the solution must be put in the context of the rest of the group's analysis.

Many other business schools use fieldwork as part of a well-balanced MBA program.

Changing technology times, however, demand more of an even mix of technology and business skills in the classroom, a mix many MBA programs don't provide.

As Elias Awad sees it, MBAs with an IS slant are a generalist's haven; they make graduates more marketable, but they can't offer students the specialized skill set needed to be *IS* executives.

So Awad, a professor at the University of Virginia in Charlottesville, spent the last six years readying a two-year IS graduate program for the university. The upshot of the degree — a master's of science in MIS — is to prepare graduates to assume leadership roles in the management of an organization's information resources. Networking, database and expert systems courses count as much as accounting, marketing and management ones.

•Founded by Thomas Jefferson in 1891, the University of Virginia offers a master's degree in MIS.

But experience may be the best teacher of all, claims Bill Kooser, executive director of the Computing Exchange Group in Chicago, a consortium of seven U.S. business schools that exchange ideas on computing and curriculum.

Kooser says that an advanced degree might help you climb the corporate ladder a little higher, a little faster, but most companies expect candidates for high-level technical positions to have put in their time with an organization and gained hands-on skills. — By Lory Zottola

Let's make a deal

The top five telecom services deals in 1988

Buyer	Purchase	Approximate value (In Millions)
Centel Corp.	United Telespectrum	$775
United Telecommunications, Inc.	30% of U.S. Sprint Communications Co.	$600
Alltel Corp.	CP National Corp.	$283
Comcast Cellular Corp.	American Cellular Network Corp.	$230
An investor group	Litel Telecommunications Corp.	$200

SOURCE: BROADVIEW ASSOCIATES, FORT LEE, N.J.

TOM MONAHAN

NOTED

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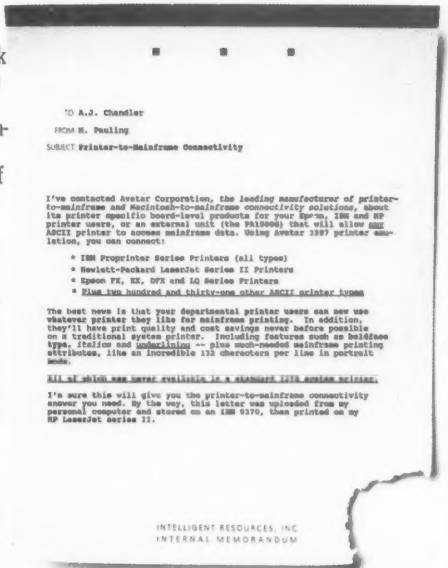

TO A.J. Chandler

FROM H. Pauling

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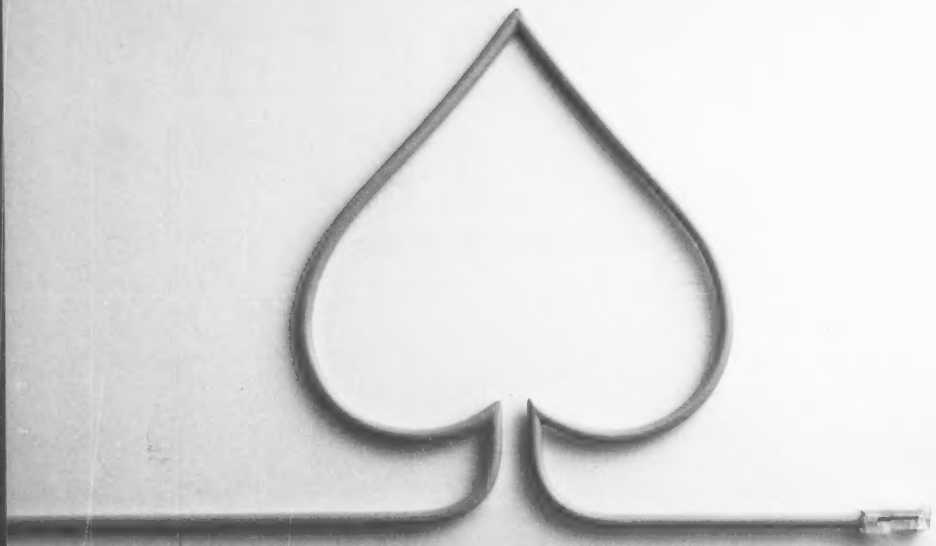
WHY GAMBLE WITH NETWORK RELIABILITY?



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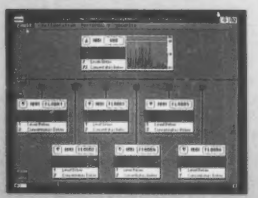

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USERS SEEK UNIFIED SOLUTIONS FROM E-MAIL VENDORS

Electronic mail is at the center of a marketing war heating up among large computer vendors that see E-mail as an important way of gaining more control of the corporate networking and integrated systems markets.

Information systems professionals should be advised, however, that the E-mail market is not as clear-cut as some vendors would like them to believe.

Fact: Most large organizations have built up several proprietary E-mail systems in their companies over the years. These systems run over diverse hardware platforms. They run over proprietary network protocols. They use incompatible E-mail formats for addressing and making user directories.

The increasing need to link these E-mail systems together has IS looking for a common, unifying set of specifications. At this point, the top E-mail contenders number three: IBM's Officevision, Digital Equipment Corp.'s Mailbus and the X.400 standard.

Each has its drawbacks. IBM's Officevision E-mail products, aimed at the company's Systems Application Architecture, still do not connect with X.400, while parts of the product suite will not be available until late 1990. DEC's vaunted OSI implementation is more proprietary than standard, and the X.400 standard itself has no installed base as of yet.

Lee Doyle, an analyst at International Data Corp., a research firm in Framingham, Mass., suggests that after all the jawing, it might be wise to sit tight when it comes to E-mail.

Companies heavily dependent on IBM hardware that have plans for SAA should implement certain E-mail gateways now and then wait for IBM's full-fledged Officevision products, Doyle says. Those firms with a strong commitment to DEC equipment should consider Mailbus to link incompatible mail systems.

It might be wise to sit tight when it comes to E-mail.

As for X.400, Doyle recommends treating it as a tactical product to create gateways between selected internal E-mail systems. Then, in a few years, Doyle says, X.400 could well have garnered enough vendor support to become a legitimate E-mail backbone. — By Stan Kolodziej

Mail file

The growth of the electronic messaging market

Segment	1987 (U.S. revenue in millions)	1988	Growth rate
Public E-mail network service	$287	$330	15%
Host E-mail MHS* software	$120	$165	38%
LAN E-mail MHS software	$10	$15	50%
Non-X.400 host gateway software	$14	$25	79%
X.400 host gateway software	$1	$4	300%

*Message handling system

INFORMATION PROVIDED BY INTERNATIONAL RESOURCE DEVELOPMENT, INC., NEW CANAAN, CONN.

IDG/CW

OFFICE SWEET OFFICE

On top of the concern IS professionals have about integrating corporate computing resources, they may now have to add the worry of integrating the office environment.

Executives should be increasingly aware of making the office work setting a more amenable place. The integrated office environment, like integrated technology, aims to make people more productive and motivated and, hence, contributes to a company's long-term economic health.

The integrated office environment aims to make people more productive and motivated.

For example, in a poll last year of 1,000 office workers by Louis Harris & Associates, 71% of the 330 employees with adjustable lighting said it enabled them to do more work. Of the 750 people with adjustable seating, 61% said the chairs made them more productive.

The ideal work area combines the following features:

- A setup that comfortably accommodates both a person and a computer system, including its tangle of wires.
- Adjustable chairs with contoured features and sculpted cushions.
- A mix of direct and indirect lighting, warm-colored light bulbs and an equitable distribution of natural light.
- "Personal" touches, such as paintings, wooden desks and round meeting tables.
- Modular partitions made of cloth to absorb sound.

In a time when firms must make the most of all resources — technology and manpower included — spending a little extra to make the office more ergonomic may bring a wealth of returns. — By Lory Zottola

NOTED

IN 1989, VAX-TO-IBM PC SHARED NETWORKS WILL INCREASE BY 76%, VAX-TO-MAC SHARED NETWORKS BY 80% AND VAX-TO-IBM PS/2 SHARED NETWORKS BY 83%, REVEALS A DEC USER SURVEY BY RALPH HEAD AND AFFILIATES LTD.

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business IMPERATIVES

Strategic systems don't have to be wildly innovative. The most effective improve nuts-and-bolts business activities.

AMERICAN AIRLINES. American Hospital Supply. McKesson Drug. In the world of strategic systems, they set the standards. American Airlines with its hugely profitable Sabre reservations system. American Hospital with ASAP and McKesson Drug Co. with Economost — distribution systems that profoundly shaped the structure of their industries. And in testament to the strength of these systems, all three companies are still reaping benefits from these systems and adding to them after more than a decade of use.

In the Hall of Fame of great systems, however, these three rattle around in a strikingly empty room. Similar successes, what Arthur D. Little, Inc.'s Toby Choate calls "breathtaking breakthroughs," are few and far between. The reason so few systems give a company long-term benefits was pointed out by economist Adam Smith at the dawn of the industrial revolution: Anything that gives one company an advantage is going to be copied by

BY MARK BREIBART
INTEGRATION STAFF

MARK GREENE/GAMMA LIAISON

SHELL OIL HAS IMPROVED *its bottom line by targeting its credit authorization equipment, according to Chester Jones, the company's general manager of technology and development.*

competitors, erasing the innovator's head start.

But those same competitive pressures that make it tough to sustain an advantage make it imperative to try, especially in these days of an increasingly global marketplace.

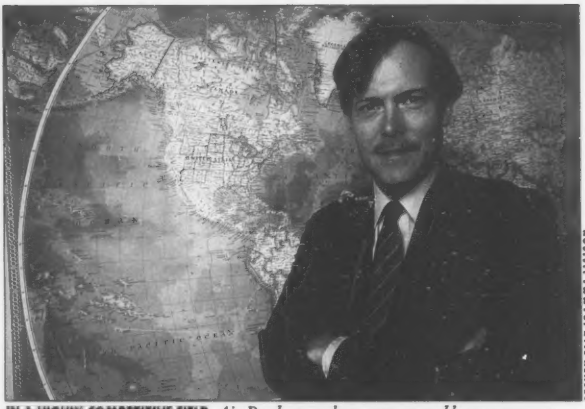
As a result, companies ranging from energy providers to retailers to hospitals are viewing integrated computer systems not as a cost but as a revenue generator. Business executives are, in a word, integrating their information systems with their business needs. And in the process, these information and communications systems are changing the way business does business.

"Companies can get a competitive advantage by doing even the basic business things — the nuts and bolts — better," says Choate, the head of ADL's information and telecommunications systems consulting practice in Cambridge, Mass.

Building such systems, of course, is no easy matter, with no magic formula. But the biggest hurdles are seldom technical. "Business managers are the real obstacle," contends John Framel, the former chief financial officer for Gulf Energy Corp.'s European marketing and refining division and now president of IR Concepts, Inc., an information management consulting firm in Houston.

Framel recalls a meeting at Gulf in which top executives couldn't figure out where all the technology dollars were going. "The problem was us," the former finance officer admits. "We were not paying enough attention" to the use and planning of information resources.

Even when the executives on the business side are paying attention, most organizations have high organizational barriers that make it difficult for business and technology managers to listen to one another.



STEVEN FALK/GAMMA LIAISON

IN A HIGHLY COMPETITIVE FIELD *Air Products seeks to attract and keep customers with better service, made possible by its on-line order entry system, Haas says.*

Slanted view

It's like the *New Yorker* magazine's view of the rest of the country, says Don Davis, a senior vice-president of the Industrial Computer and Communications Group at Allen-Bradley, a systems integrator and industrial controls maker in Milwaukee (see story opposite page). People in the business functions, manufacturing and information systems areas have their own view of the company. Dominating the middle of each image is the group's own concerns, whether operations, process controllers or technologies. "And off there in the corner or on the side are little boxes" representing the others, he adds.

One firm that has managed to mesh those worlds is Shell Oil Co. in Houston. It fills senior positions in IS with business managers familiar with technology issues. By moving people across functions, the company ensures that IS planning will be driven by business needs. "IS cannot, will not and must not be remote from the business, and the business people cannot put their ideas in a mail drop and expect to have them successfully executed," declares Chester Jones, who knows both sides of the fence. Now the oil giant's general manager of technology and development, he has also worked at Shell as a marketing manager and general auditor as well as researcher and product business manager.

A direct outcome of this process was Shell's initiation five years ago of point-of-sale equipment for credit authorization. "The business managers were driving us to rethink the retailing cost structure where credit is a major tool," Jones says. The technology people saw that improvements in telecommunications and microcomputers made possible a nationwide network that had not been economically feasible before.

With the network, Shell cut down its bad debt, reduced its receivables and shortened the billing cycle.

Other companies, too, have improved the bottom line by targeting

TRADE(ING) SECRETS: BANKS

ALL MAJOR CANADIAN banks share their automated teller machines. Customers can thus access their accounts through the machines of any bank in the country. Similar cooperation among U.S. banks has also occurred in some cities.

Part of the banks' willingness to work together comes from the cost-savings of maintaining a smaller ATM network of their own. But more important, says the vice-president of a major Canadian bank, "is that there is no sustained competitive advantage. Why spend lots of money on the basic service of getting money from a machine when your competitors will catch up with you three months later?"

operational systems. Consider changes in customer service. Strawbridge & Clothier, the $900 million retail chain based in Philadelphia, was getting low marks from customers for its too-long checkout lines. So the company experimented with Universal Product Code bar coding, scanning and price lookups at the cash registers, says Tom Rittenhouse, Strawbridge VP and comptroller. Strawbridge now has bar-coded all items in its 20-plus discount stores and 40% of them in its 13 department stores.

Scanning might not be flashy, and in fact, it's only one leg of the way toward a full Quick Response system, the retail and textile industries' version of just-in-time (see story page 28). But according to a study by Andersen Consulting in New York, this technology alone can save stores an amount equal to almost 1% of their sales a year. Not only does it speed the checkout lines and keep customers happier, but by tying to other back-office operations, it improves inventory control and reduces the labor needed to reticket goods for sales and other promotions.

Like Strawbridge & Clothier, Air Products & Chemicals, Inc. needed to improve its customer service. But as a supplier to other chemical producers, its problems did not stem from backed-up checkout lines. As the firm's chemicals group shifted its strategic emphasis from bulk commodity chemicals to specialty chemicals, it hit "a market with more customers, smaller quantities and more complex delivery requirements," says Terry Haas, the group's manager of customer services.

The specialty market is also more time-sensitive. Before, orders as large as a railroad car could be delivered in one to two weeks; now, same-day delivery is routine for bag- and pail-size quantities. But the old batch order processing system, built in the mid-1970s, was too slow and unable to keep the customer representatives knowledgeable about their customers' special wants.

A systems planning effort, led by the IS people, identified an on-line order entry system as the highest priority for the chemicals group. In an

CIM BEGINS AT HOME

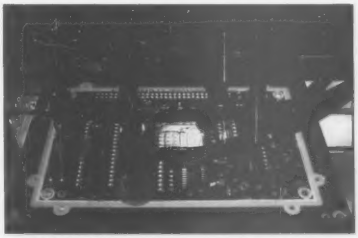
ALLEN-BRADLEY, A MAKER of industrial controls, is practicing what it preaches — that CIM is not a technology but a strategy.

In a small corner of its manufacturing plant in Twinsburg, Ohio, a pilot project that ties together engineering groups with the factory's manufacturing and testing operations has begun to add new connections to the inventory systems at the firm's headquarters in Milwaukee. More importantly, the new computer-integrated manufacturing (CIM) cell has been aimed at getting products to market faster, says Don Davis, a senior VP in Allen-Bradley's Industrial Computer and Communications Group (ICCG), which runs the facility.

Twinsburg is one of two plants that makes circuit boards for ICCG's four operating divisions. Back in 1984, its customers were demanding boards built with surface mount technology (SMT), a technique that can cram more circuitry onto fewer square inches. Twinsburg managers needed to build an automated manufacturing cell to implement SMT.

But instead of building yet another island of automation, plant managers decided to use the new cell as a test bed for tackling one of Allen-Bradley's fundamental business problems — its products had a life cycle of three to five years on average and needed to get to market quickly.

The most pressing need was to reduce what Davis calls "a huge paper shuffle." The engineers in each of ICCG's four divisions design their own products at four different locations on three different computer-aided engineering and design (CAE/CAD) systems. Before the new system, their specification drawings arrived at the Twinsburg plant by truck and were then marked up with colored markers by the manufacturing and testing groups looking for information pertinent to them. They finally were sent back to the CAD system to develop punched tapes to run the computer-aided manufacturing (CAM) system. The whole process could take up to two weeks.



A "BARE BOARD" *starts its travels through the surface mount assembly cell in the Twinsburg plant.*

Adding to this problem is Twinsburg's need for flexibility. The Twinsburg plant makes over 350 different products in short production runs, explains Greg Mesko, manager of manufacturing engineering. Engineering change orders to modify a product can come as often as every two hours. Plant managers thus wanted to reduce setup time.

Their solution was to cross organizational boundaries and integrate the CAD systems with the CAM systems on the plant floor by having all systems talk to a common database in the middle. That way, engineers, production people and testers would all be using the same data at the same time, without anyone transporting paper or reentering data.

The savings have been substantial. The time from concept to product has been cut by as much as 50%; for example, inventory has been cut by a third, and going from the design to the production stage has dropped to one or two days, Mesko says.

The plant still has a way to go. The manufacturing group is only beginning to extend the lessons learned in this cell to the rest of the plant.

industry in which customers have multiple suppliers, improved service is one of the only ways for Air Products to get ahead of the pack. Its new Advantage system was connected on March 1 to the first of 15 plants scattered around the country. It enables sales reps to fill an order, run a credit check, see if the product is in stock, identify transportation and send the order out to the plant, all within a short phone conversation with the buyer.

Reps are more productive, inventory control is tighter, invoicing is expected to be faster when that module is finished.

Proof is in the pudding

Distribution is another area in which technology can improve the business, especially when you can build a system that tracks a product from material supplies to warehousing to scanner data from the supermarkets that tells you "how it is flying off the retail shelves." That's what Jim Onalfo, the IS manager of General Foods Corp.'s $1.2 billion desserts division in White Plains, N.Y., put together for a new frozen pudding goody. The system has helped the sales and marketing people increase sales roughly 10% by letting them always know where the product is and where the holes in the service are.

YVONNE HERSEY/GAMMA LIAISON

GENERAL FOODS' ONALFO *sweetens sales by 10% by tracking product distribution from material supplies to supermarket shelves.*

One tactic for executives looking to integration for business benefits is to attack a company's functional areas, such as customer service and production. It's a tactic that can pay off handsomely.

But sometimes the issues are more systemic, more involved with a company's whole management culture. At Bayfront Medical Center, for example, no single department of the hospital stood out as a weak link. On top of all the things that any $150 million institution with 1,900 employees and a large physical plant has to deal with, the 518-bed hospital also has people's lives in its hands and needs to run at full tilt 24 hours a day. "So we have a level of tension that's unique," says Chief Executive Officer Jim Albright. "We have to develop unique ways to motivate people."

His answer was to break down the hospital's traditional hierarchical structure and to give people throughout the organization the power to make their own decisions. And Albright's strategy depends in large part on picking the right computer technology. He is building an open architecture hospital information system in which each department gets to choose and run its own system, because "it meets my socialization requirements for a decentralized management structure," he says.

Some people, of course, don't want to be socialized. When Albright started work at the St. Petersburg, Fla., hospital a year and a half ago and explained his strategy of a decentralized network, his top IS guy left, uncomfortable with the switch from an old-time Burroughs Corp. system.

But when you come right down to it, that's the flip side integrating computer systems with the goals of the business. Companies that can't keep up with the changes need to get out of the business. ♦

TRADE(ING) SECRETS: TEXTILES

THE TEXTILE AND APPAREL industries have long fit the classic mold of intense competitors. Yet, in the last several years, they have mounted extensive joint efforts in the battle to institute Quick Response (QR). In its full-fledged form, QR reportedly will tie together everyone in the pipeline — yarn suppliers, fabric makers, apparel manufacturers, sundries suppliers and retailers. The idea is to build a just-in-time system that cuts costs and improves sales up and down the line.

No industrywide process is possible without standards. So, within a 10-month period starting in May 1986, executives in the several related industries established four committees, one for each link in the chain, from yarn maker to retailer.

Though the committees' work goes on, competitive juices still flow. Jesse Johnston, director of corporate information systems at textile manufacturer Milliken & Co. in Spartanburg, S.C., says that at the linkage council meetings, which he chairs, "We limit discussions to standards and procedure and are careful not to discuss trade secrets." Part of the reason for this secrecy is a consciousness of antitrust regulations. But part of it is that QR is near a company's heartbeat. "I want to know how I can make the industry better, but I don't want to let people know exactly what Milliken is doing, or how fast I'm doing it," he says.

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crime TIME

BY ANN DOOLEY
INTEGRATION STAFF

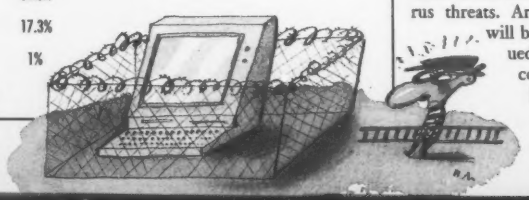
PERSONAL COMPUTER network security is everybody's business. Unfortunately, few companies see it that way. To be effective, information security has to be part of the corporate business plan, not just the responsibility of information systems professionals. Although a recent study of chief executive officers by *Computerworld* showed that 91% of those top executives consider corporate data security to be a major concern to them personally, they don't act on that concern. Security issues are left to the IS staff.

That's not all bad, of course. IS managers have the know-how to implement security measures. But in many cases, they lack the political clout and authority to make sure that information and networks in daily use by end users are kept secure. According to security experts and IS professionals, what companies need is education and a mandate from the top that end users must treat information in a responsible and ethical manner. Instead of viewing network security as a computer problem of hardware, software and communications, companies must see it as a business problem. The organizations that see it that way will have more effective security, experts agree.

Whom do you consider to be a threat against your network?

Internal employees	81.6%
Outside hackers	17.3%
Someone else	1%

Total responding: 98



To find out the state of personal computer network security, *Computerworld Focus on Integration* conducted a telephone survey of 214 IS executives in charge of security in their organizations. On the question of top management concern, almost 59% of the IS respondents felt that security has not increased as a priority for top management, even with the recent virus scares. The 41% who saw a shift in priority reported that corporate executives were allocating more money, resources, time and education to security.

At Chicago's Stone Container Corp., for instance, a security project that had been on the back burner is now being actively worked on because of the nationally publicized virus threats. And additional money will be coming for continued implementation, according to Roxolana Poluchowicz, computing facilities

manager at the container manufacturing company.

Although 81% of the IS executives surveyed said they had adequate security for their data and PC networks, only 64% have a formal security plan in place. Of those with a formal plan, the average length it has been in place is four years. Many security experts maintain that unless a plan is constantly updated, it is out of touch with the current computing practices. "Halfway security is worse than nothing at all. You get to rely on it but sometimes without reason," notes Robert Groll, vice-president of marketing at Microframe, Inc., a security company in Cranbury, N.J.

The only way to make a network totally secure is not to use it, one IS manager maintains. A more practical solution is to change people's attitudes toward security issues through corporate mandate. Employees can almost always find a way to break into a network, so it is up to IS management with top executive backing to make sure employees are aware that tampering with a network is wrong and to explain the risks and repercussions of such an action. "We need a proactive response to crime, not the current reactive one," explained Raymond Humphrey, director of corporate security for Digital Equipment Corp., at a security seminar in Boston. "You can't think of it as security. Think of it as management," he added.

Networked PCs pose a particularly acute security risk. PCs are no longer foreign objects to end users. In fact, an estimated 22.5 million PCs are spread throughout U.S. organizations. About one-fifth of these are networked, and that number is expected to grow dramatically. The push for connectivity, interoperability and transportability puts precious data more at risk. IS' security problems are compounded by integrated systems with more access points. An integrated system requires an integrated security system — a combination of top brass backing, written policies, consistent penalties and so on, notes John Muir, president of Enigma Logic, Inc., a security company in Concord, Calif.

The *Integration* survey also showed that often little centralized control exists for data on PC networks. Seventy-eight percent of the respondents said that individual departments claim ownership of their data. According to the survey, only 17% said that centralized data centers owned PC network data.

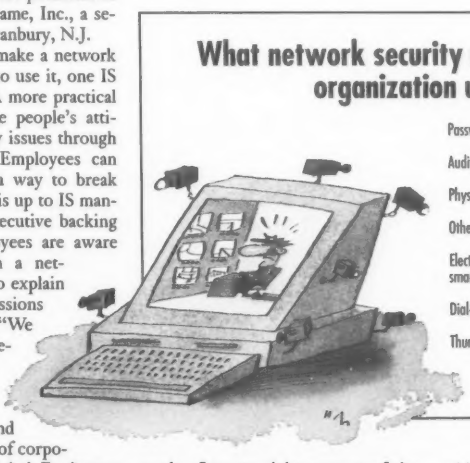
No matter who owns the data, keeping it accurate and maintaining its integrity is considered an even more serious matter than intentional security break-ins by a three-to-one margin, survey results showed (75% and 25%, respectively).

Next on IS respondents' list of concerns was intentional crime by employees. Nearly 75% of all computer crimes are reportedly committed by insiders.

The insider's motive is not necessarily monetary gain. Some employees may try to corrupt the network for the fun of it or to beat the system. The biggest threat to a network system, however, is from the employee with a grievance against a manager or a company.

It is to management's benefit, therefore, to create an atmosphere in which employees won't want to inflict damage. In many cases, this means a drastic change in management practices, something few employers may be willing to consider.

Several IS respondents also mentioned they were concerned about data theft from competitors. James Dean, IS director for the Energy Services Group, a maker of engines and compressors in Mount Vernon, Ohio, discloses that the company "has prosecuted several employees



What network security methods is your organization using?

Passwords	99%
Audit trails	73%
Physical isolation of PCs	63%
Other	24%
Electronic methods (such as smart cards)	13%
Dial-back modems	6%
Thumb/eye or voice scanning	4%

Total responding: 100
(includes multiple responses)

BAL BAYFORTH ILLUSTRATIONS

for taking information to competitors."

Most of the IS executives surveyed did not admit to any security breaches in their networks or corporate information systems. One IS manager in Colorado admitted that his company hadn't had any security problems — that he knew of. Among those who claimed not to have security problems, almost all added "yet."

How did those who have had security breaches deal with them? Responses included dealing directly with the person, firing the person, alerting the police or FBI or taking technical or organizational action, such as restricting further access, regularly changing passwords or establishing a corporate security department.

For John Clark, assistant director at insurance company Cigna Corp. in Philadelphia, any potential problems would be handled "very quietly."

The quiet approach, however, didn't work for John Maday, an IS manager at Fairmont Railway Motors in Fairmont, Minn. Someone once tried to walk off with software from the railroad maintenance equipment company, "So I hollered at him," Maday explains.

One priority to consider before implementing security procedures is to assess how much security is actually needed. The trade-offs between productivity, cost and convenience can be monumental if the information involved doesn't have to be secured in the first place. DEC's Humphrey advises IS executives to prioritize the areas of risk and then protect the most important. "You will never reach fail-safe," he claims.

In the *Integration* survey, IS executives said they protect their information in various ways. Ninety-eight percent restrict who can access the information, 77% use audit trails, 81% allow only read, not write, access and 22% use encryption. Passwords are most commonly used to limit file access and define tasks. But passwords are easily discovered or broadcast, rarely changed, have some relation to the owner and are subject to repeat entry tries.

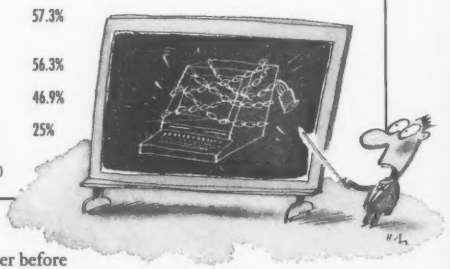
The challenge is to maintain an effective flow of information along a network without restricting users. With PCs, the user becomes the programmer, operator and security officer. Companies can protect against specific entry points and specific types of invasion, but they can't protect it all, or it would be impossible to get any work done, one IS executive complained.

A major problem is that organizations are installing PC networks so rapidly that many of the orderly development processes are being overlooked. As one IS manager states, "It's hard enough keeping up with the various networks that are popping up all over the company, let alone trying to implement security. What's really needed is a concerted effort if we want to keep our information safe." ♦

What security guidelines have you established for end users?

Published security policies	67.7%
Software guidelines (such as not using shareware)	57.3%
Not using outside or noncompany software	57.3%
Published code of ethics	56.3%
Not swapping data disks	46.9%
Other	25%

Total responding: 96
(includes multiple responses)



THE BEST DEFENSE

PC LANS CURRENTLY PROVIDE little inherent security. Companies commonly use logon security, although security experts contend that logons provide limited protection. And frequent password changes and encryption procedures all impact the way people do their work.

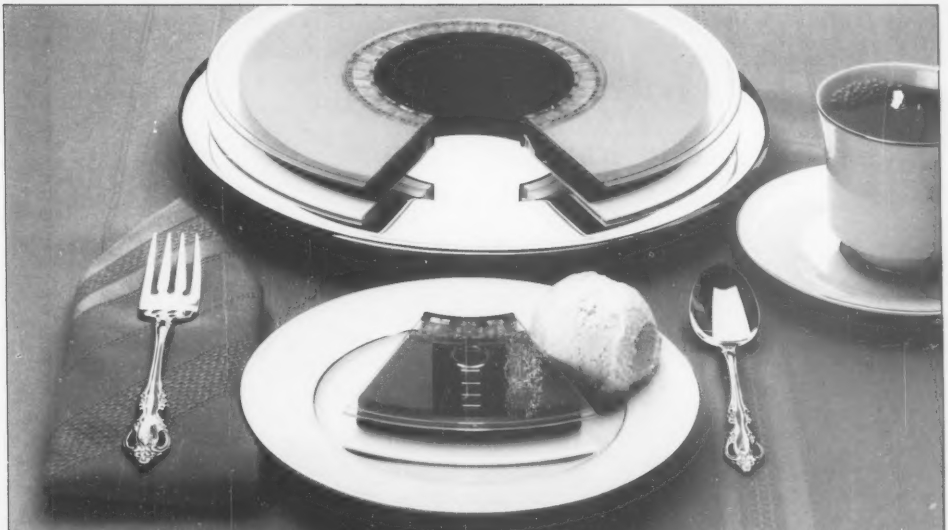
Another way to limit security threats is to restrict access to PC LANs to normal business hours and only to users with a need to know certain information.

Hardware protection, such as physically isolating PCs, is just as important as protecting software. Each physical network node is an access point. These access points include not only the PC but also servers, bridges, gateways, modems, network printers and cabling.

Raymond Humphrey, director of corporate security for DEC, says that eliminating bulletin boards, knowing the origin of software and getting rid of remote documentation and public networks can all help secure a system.

Some companies protect themselves by not using out-of-office disks, limiting the transmission of executable programs over networks, not booting hard-disk systems from a floppy unless it is the original, not executing programs of unknown origin, not using network file servers as workstations and never adding data or programs to system master disks.

The *Integration* survey found that to protect against computer viruses, 25% of the IS respondents said they use prevention devices, and 4.5% use cleanup devices. A whopping 62% use no such devices at all.



When choosing a network access package...why settle for just a piece of the pie?

If all you want is access to your network, a number of software vendors can help you. But, if you want more than just a piece of a product, you need NCI from Westinghouse.

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Circle Reader Service Number 14

Call them visionaries. Call them innovators. Call them executives who live their professional lives on the horizon line of technology. Before there were industry buzzwords like interoperability and heterogenous computing, there were individuals who saw the need to interconnect information and the way it was being delivered.

"Visionaries see the whole view," says MIT professor David Clark, who is also a senior research scientist at the school's Laboratory for Computer Science. "They see computers as only one piece of the puzzle."

Typically, visionaries are not from a company's core computer culture, he explains. And just as typically, a company's senior management finds these innovators elsewhere in the corporation or outside of it. Observes Clark: "Innovators are those individuals who are not entrenched doing things the old way."

To integrate their computing resources, IS professionals must have a vision of restructuring a business and, accordingly, the platforms on which to achieve their companies' goals. Viewing integration as the one key platform, *Computerworld Focus on Integration* interviewed a number of systems innovators who dared change the systems status quo.

visionaries

BY HELEN PIKE
INTEGRATION STAFF

YVONNE HERSEY/COMMA LIAISON

ELAINE BOND
Chase Manhattan Bank New York

"IT FELT LIKE I HAD LANDED FROM Mars. Everyone was thinking decentralized," remembers Elaine Bond when she set foot in her new job at Chase Manhattan Bank in 1981 after 24 years with IBM.

"At IBM, we had already gone through decentralization and had been integrated. At Chase, though, integrated computing meant centralization, [which] was the furthest from anyone's mind," she says.

Yet something had to be done, explains Bond, Chase's senior vice-president for corporate systems, because with different computing resources in 100 offices worldwide, "Chase still had gobs of interdependencies."

The challenge became how to make all those parts appear to be a whole without reconsolidating everything, Bond says. The solution was to network machines from Wang Laboratories, Digital Equipment Corp. and IBM into "a big distributed environment by interconnecting electronically all those computing nodes.

"I understood technology from [the areas of] research, applied technology, sales and marketing, product development, operational and

internal use," says Bond, 53, of her IBM years. "I've always been a manager of technical activity and have always had a bias to look at this stuff from a business perspective."

Bond's blueprint came from the telephone system. "It has a magical capability. You can get to any person anywhere in the world for as long and as fast and in any language on any subject. The only agreement is that they have to want to talk with one another." She likens data processing nodes to a phone company's central offices. Both are placed around the globe, are interconnected and are transparent to the user.

"When you begin putting power at the desktops with telecommunications, you begin to see what mainframe work you can get done on a PC," she says about distributed processing. "Telecommunications is already an integrated system with all the different networks."

MICHAEL MISTROVICH, 46, OVERsees an integrated information initiative aimed at dispensing better health care services at U.S.

MICHAEL MISTROVICH
Office of the Secretary of Defense
Washington, D.C.

Department of Defense hospitals and clinics around the globe.

It is called the Composite Health Care System, and, according to Mistrovich, deputy assistant secretary of defense for health management systems, it will establish an integrated computer architecture to take the DOD beyond the year 2000.

Mistrovich is talking about the range of data from outpatient/inpatient care, laboratory analysis, doctors' analyses, radiology reports, pharmaceutical purchases and administration. According to military classification, more than nine million people are eligible for DOD care, and many, under the proposed computing platform, will receive their care from 168 hospitals or more than 500 DOD-operated clinics worldwide.

He envisions a "one-stop shopping" system, for example, where there will be no waiting for prescriptions to be filled because the necessary data will be automatically entered into the centralized system from the examining rooms. No lost lab slips. No missing X-ray reports. Special diets at the touch of a keystroke.

In essence, the system is a central patient database complete with multiple security and access controls. The DOD is using DEC equipment, along with twisted-pair and fiber-optic cabling for data transmission.

The Composite Health Care System is subject to congressional review, and testing has begun at 14 hospitals worldwide.

IN 1980, A 36-YEAR-OLD BOB EVANS visited Xerox Corp. in California and got a chance to tour its famed Palo Alto Research Center. There he saw a demonstration of peer-to-peer networking that fit computing power to the needs of the organization instead of making the organization change its computing architecture. He also saw computer programs that used icon images.

Evans was intrigued with what he saw but didn't see an immediate way in which he could bring the new technology back to El Paso Natural Gas in Texas where he was the vice-president of information systems and product accounting.

Four years later, he did.

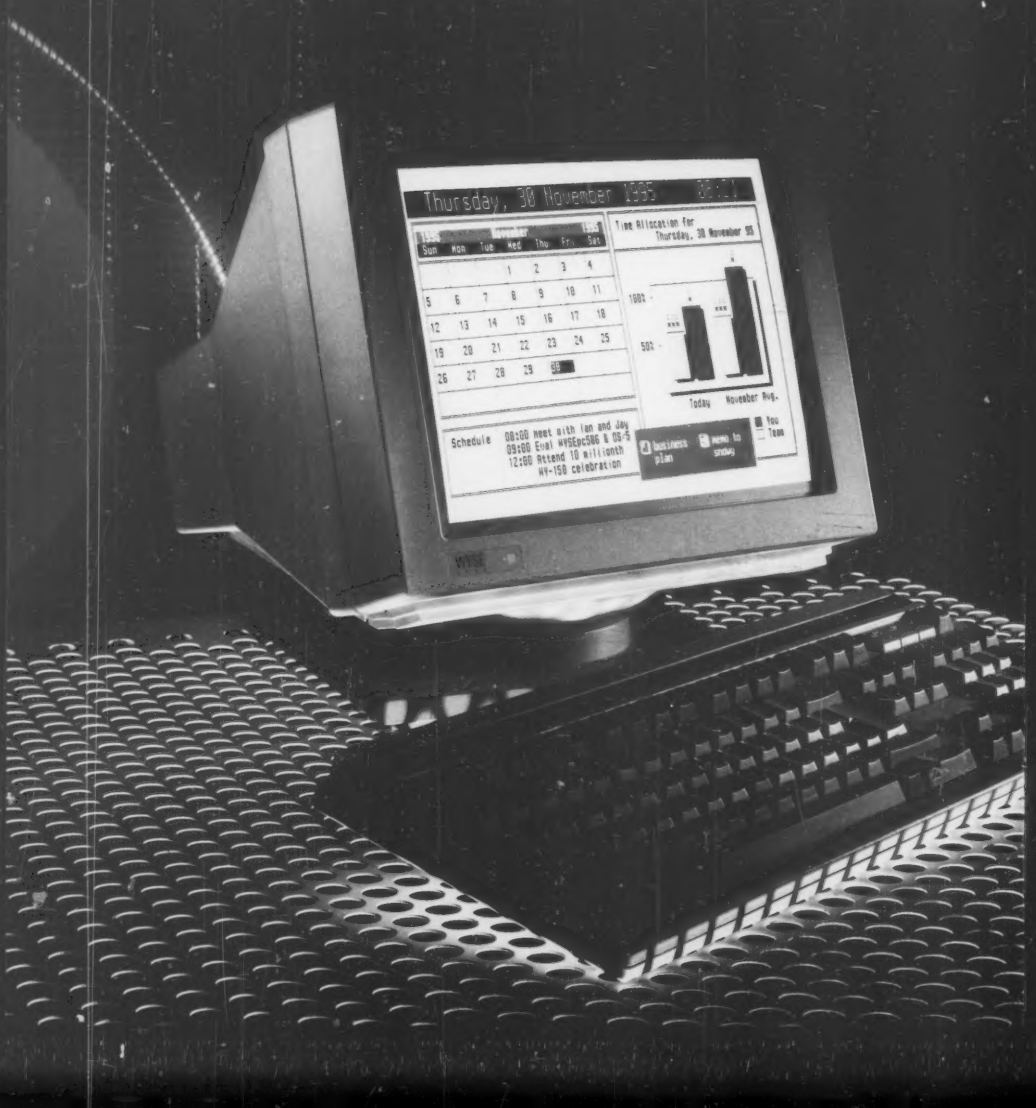
Evans responded to a a corporate mandate to cut costs and deliver more computing by networking minicomputers from Wang Laboratories. The plan involved a risk — moving away from a mainframe environment and El Paso's dominant supplier, IBM.

"There was no other commercial role model at the time," Evans says, and recalls asking himself, "Can I run the whole company on a group of networked computers?"

As an experiment, Evans took the largest mainframe application he had and put it on a mini. "It ran," he says. And so did Evans — he was off and running with a plan to network 12 minis, each one dedicated to an applications area. From an IS budget totaling $24 million in 1984, Evans got his budget down to $16 million in 1988 through networking.

Given the vagaries of the energy industry,

The Terminal O Arrived A



f The '90s Has Bit Early.

Wyse introduces the WY-150. They always said there would be such a terminal "someday". It would have the flexibility and connectivity to operate in virtually any computing environment, while meeting the most exacting ergonomic requirements. And, it would deliver those advantages at an affordable price.

"Someday" is here much sooner than expected. It's called the Wyse WY-150, a breakthrough in terminal technology that will set price/performance standards for years to come.

Bridging the worlds of ASCII, ANSI and PCs, the new WY-150 offers compatibility with a wide range of operating systems. Including UNIX/XENIX, MS-DOS, Concurrent DOS, PC-MOS, and PICK. With a choice of three keyboards. And typical of Wyse, the WY-150 does it all with stylish design, at a price that's also attractive.

Choose your favorite keyboard from three WY-150 options.

The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

The WY-150 is also part of *SystemWyse*. It links effortlessly with Wyse PCs and multi-user platforms to create uniquely integrated and cost-effective solutions. Everything is designed, manufactured, and tested by Wyse to work together. And it's all backed by the service and support of the world's leading independent terminal maker.*

Only one question remains. Now that the terminal of the '90s is here, what are you waiting for? Call for more information.

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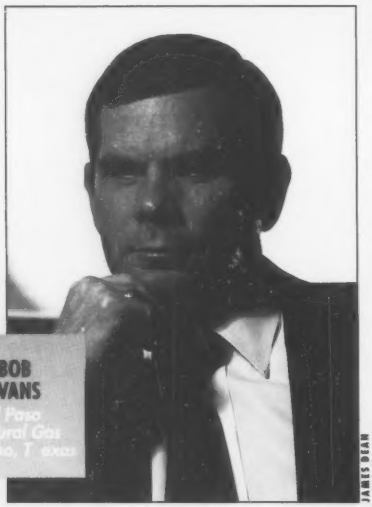

JAMES DEAN

BOB EVANS
El Paso Natural Gas
El Paso, Texas

the minis have allowed the $1.2 billion gas company to keep up with business changes more quickly, he adds.

With a nimbler computing environment, no one would ever accuse Evans, who uses an Apple Computer, Inc. Macintosh in his office, of being entrenched in his company's computer culture.

PHYLLIS GARDNER WAS LOOKING for new managerial challenges when she went to work as a kind of high-tech amicus curiae to the U.S. Department of Justice.

Her plan for the department could be viewed as a form of integration justice brought to the information system that supports Uncle Sam — a system that in 1980 was still largely conducted on typewriters and with IBM mag cards. "A plan started to develop in my mind on how to synthesize all of it," says Gardner, who was named director of the department's Office of Management Programs.

"The legal profession can really embrace technology," she adds, referring to the document-intensive needs of lawyers, and in this particular case, of attorneys in the Civil Division of the Department of Justice.

Local-area networks became the basis for Gardner's strategy to put a workstation at the fingertips of every Justice Department lawyer. Under the plan, called Amicus after the Latin word for friend, users accessed information by modem from Lexis, the electronic law library, and from databases of agencies' rules and regulations, court dates, legal files and briefings resident on the host mainframe. They were able to output their work on printers.

Amicus grew to support 250 attorneys, handling upward of 50,000 civil cases. Between 1983 and 1988, Amicus saved $21.2 million in attorneys' services and $5.4 million in clerical work, according to Gardner.

But Gardner, 42, is a modest manager when it comes to information systems, despite being recognized by American Management Systems,

TERESA ZABALA/GAMMA LIAISON

PHYLLIS GARDNER
Steptoe & Johnson
Washington D.C.

Inc. and Carnegie-Mellon University's Graduate School of Industrial Administration for her work at the Justice Department. She is now the executive director of Steptoe & Johnson, a law firm in the capital, which hired her to implement a vision of high-tech efficiency.

"THERE'S NEVER BEEN SO MANY very strong technology solutions and confusion over how to implement them," observes Mark Teflian, technical planning and systems engineering vice-president for the Covia Partnership. The company has used computers and networks to grow from operating a simple airline reservations system into being a worldwide travel distribution company, owned as a partnership by six different airlines.

"No one from a transaction processing world was moving in this direction of distributed processing," Teflian says about the movement from batch to interactive mode for Covia's Apollo reservation system. "Our need to

Heckuva way to run a network.

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Network Systems.

MARK TEFLIAN
Cavio Partnership, Rosemont, Ill.

ROARK JOHNSON/GAMMA LIAISON

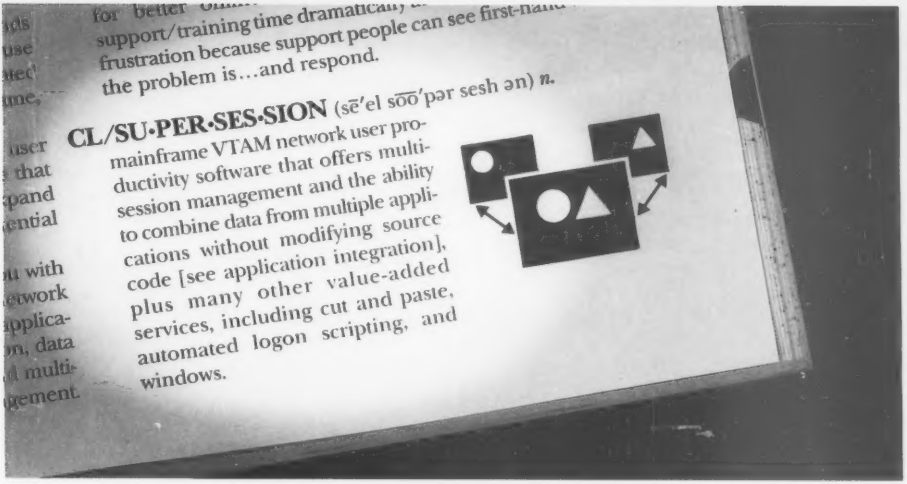
integrate came from our need to distribute our data."

Teflian, 32, is halfway through implementing a 10-year plan that calls for a three-level, peer-to-peer-based architecture that preserves old applications while allowing for the introduction of new ones across a workstation platform of IBM Personal System/2s using IBM's Systems Network Architecture and LU6.2.

An electrical engineering student in college, Teflian describes the exhaustive conversion plan as a "resystemization." ♦

OUR INNOVATORS PEGGED the following technologies to propel integration:

- The IS function will take on an increasingly business-oriented character and will use AI workstations to get the job done.
- Multiple windows will push workstation technology.
- The power of new microprocessors will further bolster the windowing environment, allowing for access to multimedia.
- Object-oriented programming techniques will solve the software bottleneck at the application-code level.
- Software will emerge that will bridge worldwide E-mail messages from multiple vendors.
- Digital imaging and optical disk storage will enhance document work.



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To improve network financial planning, CL/SUPERSESSION's Network Accounting Facility provides complete activity recording, including all network logons, session initiations/terminations, and traffic volumes for precise chargeback billing and usage auditing. And for at-a-glance monitoring of multiple sessions, our new windowing feature will let you view sessions side by side on a single screen. What's more, you'll never compromise on security. CL/SUPERSESSION interfaces with RACF, ACF2, and TOP SECRET.

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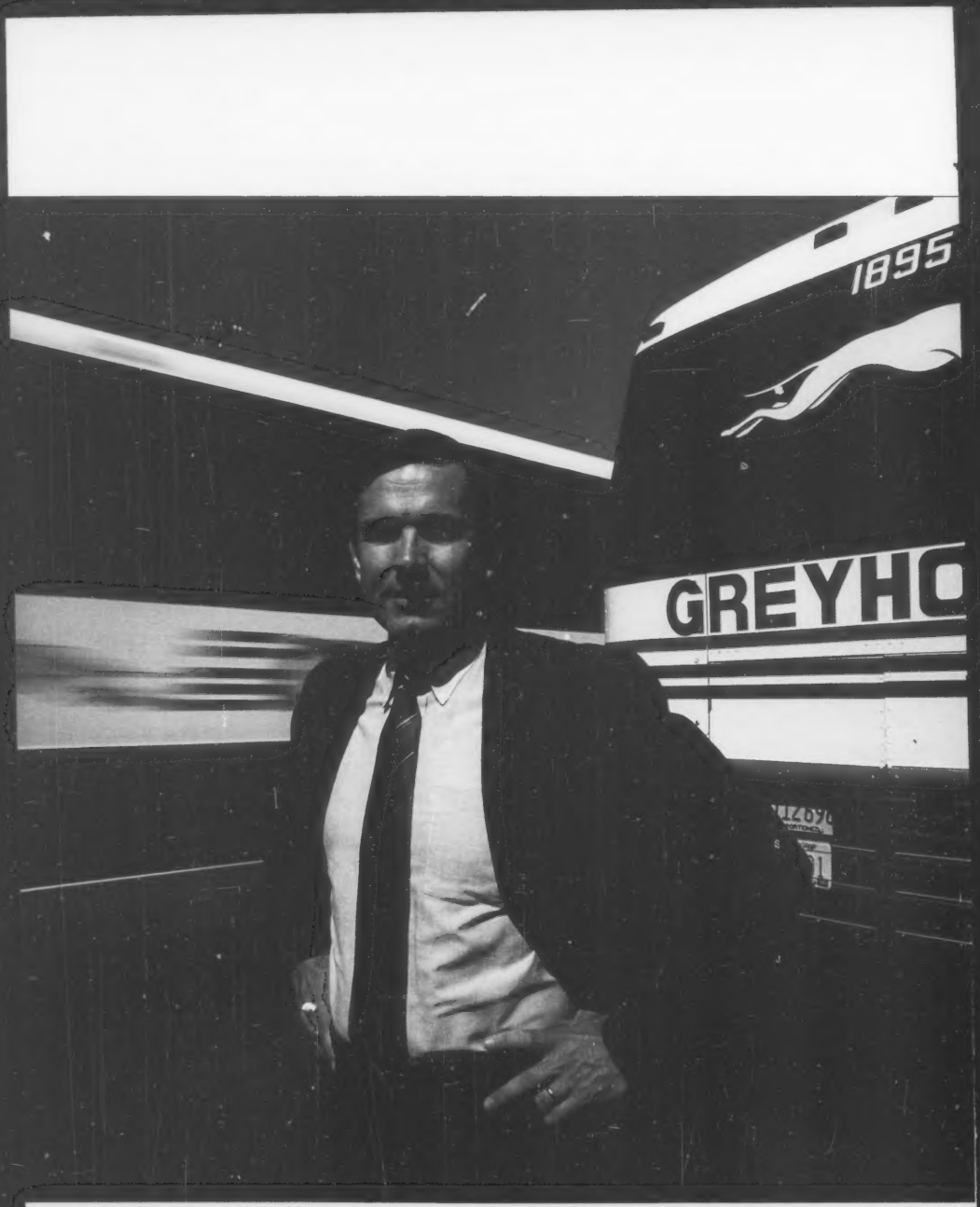

BEHIND THE DRIVING FORCE *of Dennis Connor, senior director of IS, and his staff, Greyhound Lines' integration strategy moves ahead.*

STEVEN SAXTON/GAMMA LIAISON

en route TO CUSTOMER SATISFACTION

BY STAN KOLODZIEJ
INTEGRATION STAFF

FROM DENNIS Connor's office, you can see a lot of country. For miles, lines of darkly paved highway, very straight, cut across neatly furrowed farms. Above it all is plenty of sky.

Connor is at the center of it all, literally. Situated in West Des Moines, Iowa, Connor and Greyhound Lines, Inc. are at the very heart of America. And now Greyhound Lines wants to be at the heart of the transportation business again.

The senior director of IS, Connor joined Greyhound Lines less than a year ago. He has become the choreographer of a number of computer networking moves that Greyhound is hoping will propel its bus transportation business back into the black.

It's a big job. Connor and his information systems team are now developing, revamping and integrating several networks and databases ranging from the crucial passenger reservations system to a system that tracks lost baggage. The company has ambitious plans to use the latest computer technology to streamline almost all aspects of its business.

The venerable 75-year-old bus company was synonymous with the freewheeling rise of postwar motoring across America. But in the past decade or so, Greyhound has often become equated more with decline and outmoded ways to travel.

Losing much of its business to airlines, which cut their prices

IN 1931, THE MACK TRUCK CO. *was asked to build a coach for Greyhound; the result was a luxurious bus (above). Passengers relaxed in mohair seats with horsehair stuffing, as side curtains kept out roadside dust and glaring sunlight. The Mack Bus was equipped with bullet-style shock absorbers and a six-cylinder engine for smooth riding.*

MOTORING

GREYHOUND'S PASSENGER MILES, WHICH ARE THE YARDSTICK BY WHICH THE COMPANY MEASURES BUSINESS GROWTH, HAVE DECLINED SINCE THEIR HEYDAY IN 1980. BUT SINCE 1987, THEY APPEAR TO BE ON THE RISE AGAIN. THE FOLLOWING IS A BREAKDOWN OF PASSENGER MILES, WHICH INCLUDE BOTH GREYHOUND AND TRAILWAYS FIGURES:

- 1979 — 10.9 BILLION
- 1980 — 11.2 BILLION
- 1981 — 10.4 BILLION
- 1982 — 10.3 BILLION
- 1983 — 9.0 BILLION
- 1984 — 8.3 BILLION
- 1985 — 7.3 BILLION
- 1986 — 6.1 BILLION
- 1987 — 6.3 BILLION
- 1988 — 6.8 BILLION

following deregulation of the airline industry, Greyhound's image also declined. Its bus terminals, located mostly in the center of U.S. cities, suffered during the period of general urban decay in the 1970s. Greyhound buses, through a lack of strict maintenance schedules, also began to look shabby.

Beginning in 1981, Greyhound suffered through six straight years of decreasing passenger miles (see box this page), which are the number of miles ridden by paying passengers and a yardstick by which Greyhound measures business growth. The general image was of an industry and a company in bad health.

The first step toward Greyhound's recovery came in March 1987. At that time, three investment partners, led by Dallas investor Fred G. Currey, purchased the troubled Greyhound Line division from its parent, Greyhound Corp., a holding company with interests in such areas as airline food catering, personal care products and a cruise ship line. Connor credits the new owners with pushing quickly for technological change at Greyhound Lines.

That's the ticket

The first target was the pivotal passenger ticketing system. At the time, Greyhound's reservations system, which used IBM point-of-sale (POS) terminals, was too slow, taking minutes to generate tickets while passengers often waited in long lines.

The number of variables involved in bus reservations and pricing can be enormous. Bus passengers can get off at any number of towns between two major cities, they can board at a Greyhound feeder route or perhaps from another bus line, they can get off for a while then get back on and so on. The POS systems located at major bus terminals across the country bogged down under these logistical burdens, and business flagged.

New muscle was brought in last year with the Gateway reservations system. The system has seeded about 500 networked AT&T 6300 and 6312 personal computers across the country at 152 Greyhound terminals.

The turnaround brought about by Gateway has been dramatic, Connor says. Passenger tickets and schedules can now be generated four to five times faster than with the old POS system. It has also broken open the world of pricing levels. Connor claims that Greyhound's reservations system is now capable of handling approximately 10 million combinations of fares and destinations. In contrast, the old POS system could only handle 107 combinations.

By way of Dallas

The firm's Greycom network handles U.S. bus scheduling, linking all Greyhound dispatch offices through the Des Moines data center where an IBM 3081 is located. Channeled through the mainframe, on-line dispatch data arrives at a computerized operating center in Dallas and enters a master schedule database. The Dallas center is manned 24 hours a day and is the nerve center of Greyhound's bus movements.

Greyhound measures the efficiency of its scheduling process by analyzing the number of bus miles each passenger travels. Greyhound feels that by streamlining its route schedules, it can reduce unnecessary miles logged by its buses.

To achieve this goal, Connor is working with Andersen Consulting on a scheduling tool that will provide schedulers with "what-if" capabilities. The tool will eventually interface with the on-line master schedule database in Dallas. By this summer, Greyhound expects to install a network bridge that will automatically bring routing and fare data directly from its Gateway reservations system and its telephone information centers (TIC), bypassing the mainframe in Des Moines.

Along with Greycom and Gateway, the TICs, located in Omaha, Charlotte, N.C., and San Antonio, are a key part of Greyhound's systems strategy. Most of the centers use Tandem Computers, Inc. fault-tolerant machines; the San Antonio TIC is linked into the Tandem machine in Omaha through a terminal. Operators at these locations can give those who dial a toll-free 800 number up-to-date information on Greyhound prices and routes throughout North America.

"I've got 800 traders, all on one network. And we expect to add another 50 in the next year. I don't even want to think about what would happen if that network goes down.

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Circle Reader Service Number 19

THE 1947 SILVERSIDES BUS *(above) was made of sleek stainless steel and aluminum and claimed a number of firsts — it was the first fully air-conditioned Greyhound bus and the first bus with a retractable entrance door and gear shift enclosed in the steering column.*

According to Connor, the master schedule database in Dallas will make a natural fit with the TICs to make sure that center operators have the latest route and pricing changes.

Greycom, Gateway and the TICs will all be networked and interfaced one day, Connor says. The linking of TIC with Gateway, for example, will enable passengers to charge advance-purchase tickets with major credit cards.

An integral part of the Greycom system is the Bus Parts Inventory Control System (BPICS), which will keep an eye on maintenance of Greyhound buses. With Greyhound's purchase of Trailways Lines, Inc. in July 1987, the number of Greyhound buses rose nearly 50%, and with the purchase of an additional 200 buses, Greyhound's fleet now tops 4,000.

The BPICS system is centralized through the Des Moines 3081 (Connor is looking to replace it with an IBM 3090). But Connor has a bid out now to develop a distributed parts inventory system using Intel Corp. 80386-based processors at the garages connected to either a mainframe or AT&T 3B2 minicomputers running Unix.

The current integration strategy might already be helping Greyhound turn the corner. In 1987 and especially 1988, Greyhound, boosted somewhat by the Trailways acquisition, posted its first gains in passenger miles since 1981.

At Greyhound Lines, it appears much of the driving is in the hands of Connor and his department. ♦

EASY RIDER

WHO TYPICALLY RIDES A GREYHOUND BUS AND FOR WHAT REASON? GREYHOUND LISTS THE FOLLOWING AS THE CHARACTERISTICS OF THE TYPICAL GREYHOUND BUS PASSENGER:

- SHE IS FEMALE.
- SHE IS BETWEEN 16 AND 24 YEARS OLD.
- SHE HAS SOME COLLEGE EDUCATION.
- SHE HAS NEVER BEEN MARRIED.
- SHE IS TRAVELING ALONE.
- SHE IS VISITING FRIENDS OR RELATIVES.
- SHE IS FROM AN URBAN COMMUNITY.
- SHE IS EMPLOYED FULL TIME.

YOUNG AT HEART

IT'S ODD TO HEAR 75-year-old Greyhound Lines referred to as a young company, but it's all in how you look at it. Doug Desch, manager of data communications at the bus company, says the new Greyhound is distancing itself from the old in several networking ways.

The first distinction was consolidating data communications activities under one roof, following the purchase of Greyhound Lines by an investor group in 1987.

BILL GILLETTE/GAMMA LIAISON

DESCH *sees a networking distinction.*

"Data communications responsibility used to belong to the application group that owned the function being networked," Desch recalls. "People would implement a data communications project, and then at a certain point they would call technical support people in for help."

Desch says that at the time of the purchase, his group acted basically as a service bureau for parent Greyhound Corp. Greyhound Lines was treated like any other division serviced by the centralized datacom function.

"The problem was there were so many people dabbling in networking without the proper technical expertise, and there were no procedures for making or requesting communications changes," Desch explains. "We had to be called in a lot to straighten projects out."

Also part of the plan for the "new" Greyhound Lines is a big push toward network management systems, he says. The increase in networks and the linking of those networks puts a premium on network troubleshooting and on keeping track of the increasing amount of network equipment, he explains.

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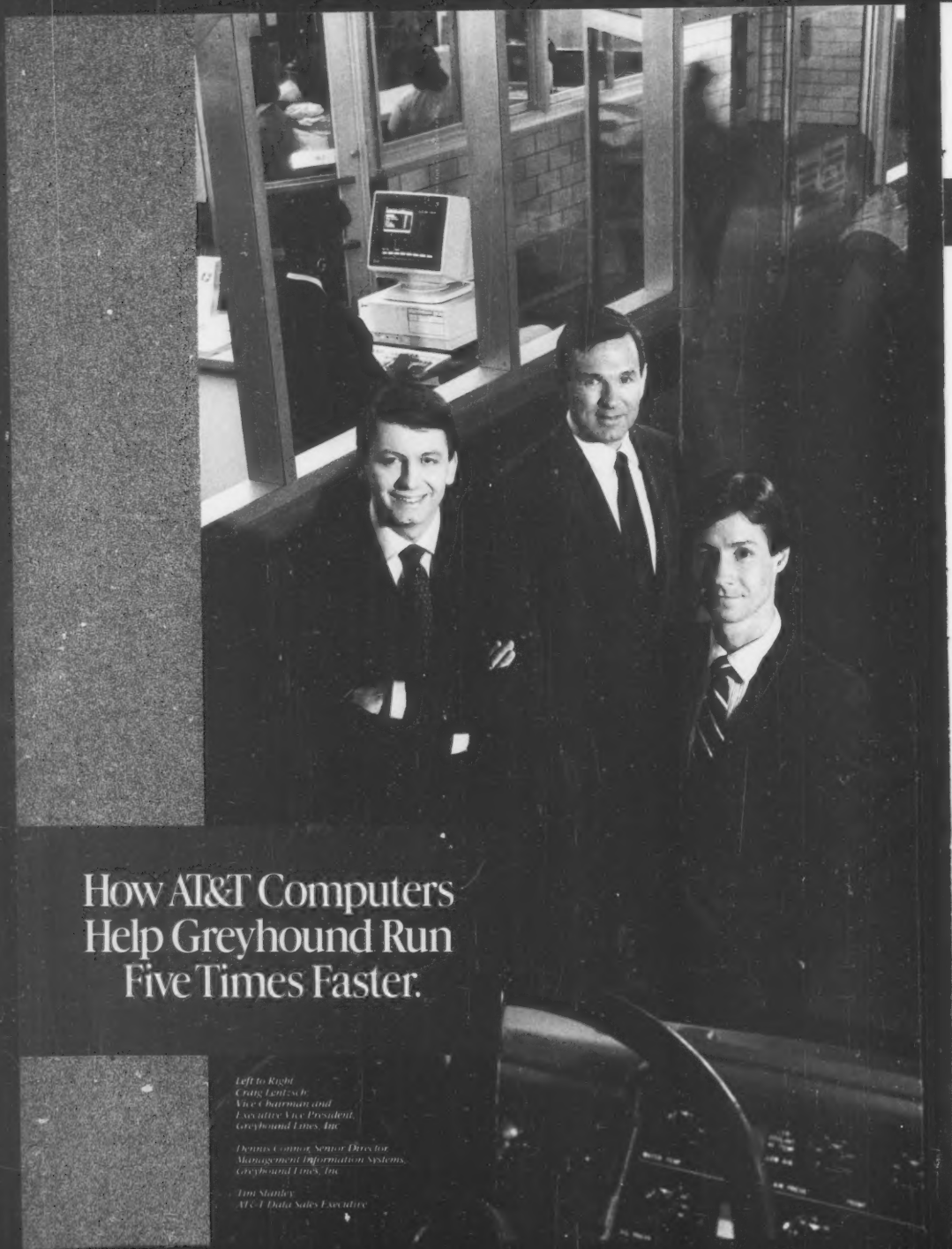

How AT&T Computers Help Greyhound Run Five Times Faster.

Left to Right
Craig Lentzsch,
Vice Chairman and
Executive Vice President,
Greyhound Lines, Inc.

Dennis Connor, Senior Director,
Management Information Systems,
Greyhound Lines, Inc.

Jim Stanley,
AT&T Data Sales Executive

Dallas, Texas
March 1, 1989

Tim: The first time we met, you had an ambitious plan to completely automate your scheduling and ticketing operation. I was astonished at its complexity. You have 165,000 combinations of fares that a customer could ask for.

Craig: Ticketing automation was part of our master plan to remake Greyhound from the ground up. You can see why.

Dennis: Our old ticketing system wasn't good enough. We had trouble with volume and updating the point-of-sale terminals. Frequently the agents would have to thumb through thick manuals to get fare and schedule data.

Craig: It took three or more minutes to issue a ticket, which was not acceptable. You helped us design our ticketing solution based on AT&T WorkGroup System computers.

Tim: And today you have happier customers!

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Craig: Since we can't afford downtime, your top-to-bottom commitment to supporting the total solution sold us on AT&T. We saw you as a partner for computer solutions, not a PC vendor. Anyone can sell PCs or minis.

Dennis: You were the only computer company with a nationwide service network and the willingness to respond to us on demand.

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Dennis: We are tying our networks together. Whether it's packages or people, it's one screen.

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SHOULD I **stay** OR SHOULD I GO?

OS/2 may have all the pizzazz, but MS-DOS seems to have all the users.

"CONVERTING FROM DOS to OS/2 is a very traumatic and expensive experience, and when faced with the task, inertia wins out," says Rich Finkelstein, president of Performance Computing, Inc., a Chicago database consulting firm.

Inertia is hardly the stuff of which great corporations are made. But the figures bear him out: Most information systems executives are staying with their current operating system mainstay, MS-DOS.

The reason IS executives are not flocking to OS/2, with its promises of multivendor connectivity, multitasking, greater memory capacity and so on, is a lack of application software. The dearth of OS/2 application software relegates the new operating system to more of a curiosity than a viable alternative to MS-DOS.

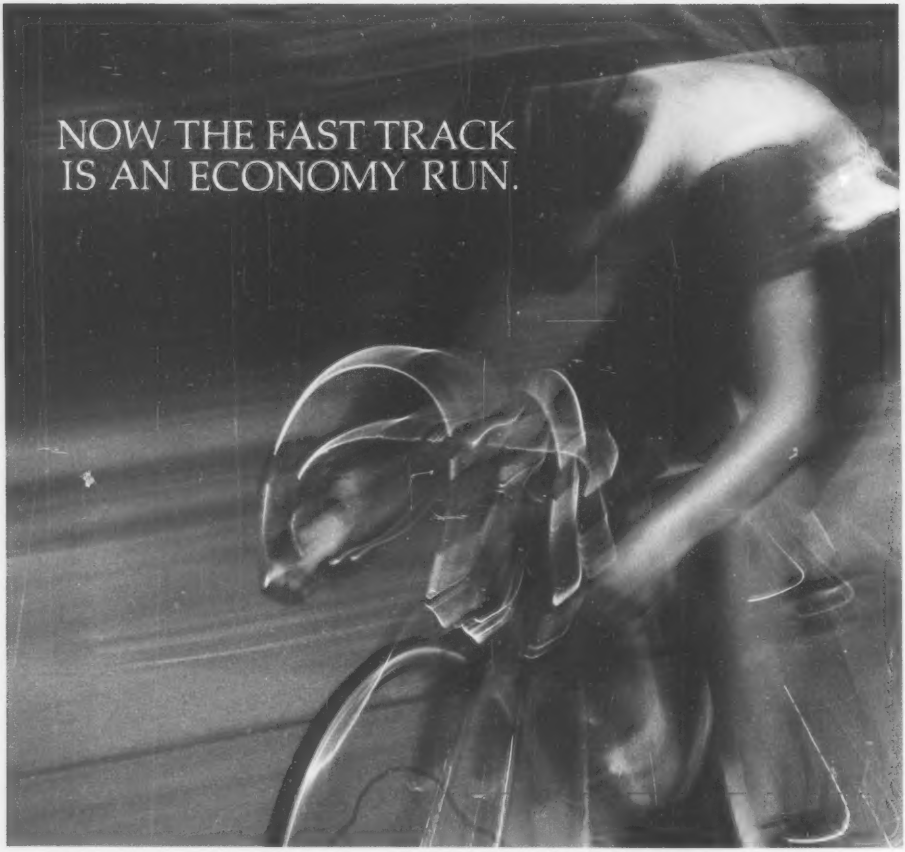
"People buy applications, not operating systems," says Jonathan Yarmis, an analyst with Gartner Group, Inc., a market research company in Stamford, Conn. "There are no business applications out there to make people switch to OS/2. And the organizational and hardware costs necessary to migrate to OS/2 are ridiculous."

Despite IBM's continuing efforts to breathe life into the operating system, which are said to include OS/2 memory rebates and OS/2 application discounts, OS/2 sales have fallen well below projections. And according to recent reports in the press, of

ZARLEY is a free-lance writer living in Rhinelander, Wis. He has written for a variety of computer publications.

BY CRAIG ZARLEY

BETHANY GULLY



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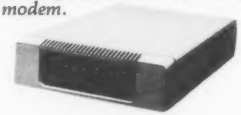

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the more than 200 software developers claiming to have shipped OS/2 products as of Jan. 1, about 44% have either delayed or abandoned their OS/2 development efforts.

And while IBM's Officevision products, the first true OS/2-based applications that take advantage of multiprocessing and large memory, have given a boost to OS/2, their full impact on the market will not be known for awhile. The products will not begin shipping until the fall, and their announcement does not guarantee a quick implementation.

Happy medium

But a middle ground is emerging between the hype and the cynicism as IS managers plan how to integrate OS/2 into their organizations. For starters, almost no one is rushing to upgrade system hardware to run OS/2 on individual workstations.

Industry observers agree that users need at least a 16-MHz Intel Corp. 80386-based personal computer with 4M bytes of random-access memory to run OS/2 at acceptable speeds. Even if applications software were available, the cost of upgrading thousands of PCs is prohibitive.

Instead, the first OS/2 applications will be server based. With OS/2 installed on local-area network servers, companies can take advantage of OS/2's multitasking and its ability to address up to 16M bytes of memory (as opposed to 640K for MS-DOS) without incurring the expense of installing the operating system on individual workstations.

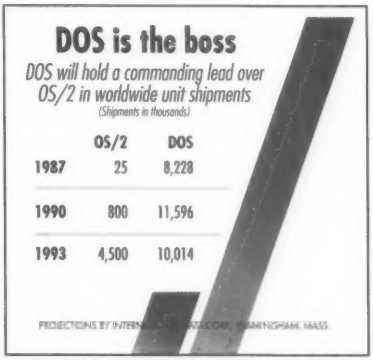
If OS/2 does supplant DOS in the business application arena, it will come on a case-by-case basis with entirely new systems developed rather than porting an existing DOS application to OS/2.

OS/2's missing pieces continue to blunt development efforts among both software vendors and in-house corporate development staffs. IBM and Microsoft's OS/2 Presentation Manager, the object-oriented interface designed to match OS/2's power with ease of use, is a prime example.

Presentation Manager wasn't even included in OS/2 until last October when IBM released OS/2 Extended Edition 1.1. Furthermore, direct support for Presentation Manager-based queries won't be a part of OS/2 until this fall when IBM ships Extended Edition 1.2.

"We'd buy OS/2 right now, no matter what the cost, if it offered a Presentation Manager interface and SQL queries to local and host databases," says Ray Jordan, manager of consulting services in the corporate information services division at Pfizer, Inc., a pharmaceuticals firm in New York.

Indeed, it is as an SQL database server that OS/2 seems poised to make significant inroads.



SQL allows users to access data from a variety of host systems without regard to where the specific data may reside and without knowing how to execute queries on the disparate databases. Because corporate users may need to sort through huge files on multiple databases simultaneously, OS/2's multitasking and advanced memory addressing capabilities teamed with SQL make the new operating system an ideal candidate for future corporate database servers.

Here to serve you

IBM's OS/2 Extended Edition 1.2 will add server capabilities to OS/2's Database Manager. In addition, the Ashton-Tate/Microsoft/Sybase SQL Server has just hit the market, joining Menlo Park, Calif.-based Gupta Technologies, Inc. and College Park, Md.-based XDB Systems, Inc., which are already selling database servers for DOS and OS/2.

"If you want a combination of a graphical user interface and communication to mainframes, then OS/2 is the answer," says James Johnson, vice-president of business program strategy at The Equitable Insurance Co. in New York.

Johnson is currently supervising an OS/2 application development effort. While he declined to offer specifics, he hints broadly that the project involves providing a common Presentation Manager interface to multiple, concurrent host database queries.

"Just think of the increased capabilities that could offer large companies," he says. For insurance companies, for example, a common interface to all databases would enable an adjustor to get a complete client history without having to use different command sets for each database in which information on the client resides. "The productivity gains would completely swamp any cost issues," Johnson explains.

OS/2's missing pieces and a lack of third-party application software have done little to dampen Johnson's enthusiasm for the operating system. He's sticking to his timetable of having The Equitable's first OS/2-based application up and running by the end of the year.

While OS/2 is gaining greater acceptance in large corporations, its introduction inches along on an application-by-application basis rather than sweeping aside an old standard for a new. And no prudent software developer is about to ignore the more than 20 million DOS machines as evidenced by the spate of DOS product offerings at the latest Comdex show.

Still, there are those who maintain that OS/2 will be the future computing standard. "OS/2 will triumph when people understand the capabilities of the operating system and purchase new machines for new applications," explains Performance Computing's Finkelstein. ♦

allied FORCES

These days, it's unite and conquer

BY STAN KOLODZIEJ
INTEGRATION STAFF

IN MICHIGAN, SEVERAL rival engineering firms meet, share engineering and computer-aided design data across their computer systems, then make a mutual bid on a production contract from one of the Big Three automakers.

In Manhattan, a credit card owner keys some numbers into an automated teller machine (ATM) and updates his frequent-flier miles. He is pleased to see that the furniture he recently purchased with a credit card has added 5,000 miles to his frequent-flier total.

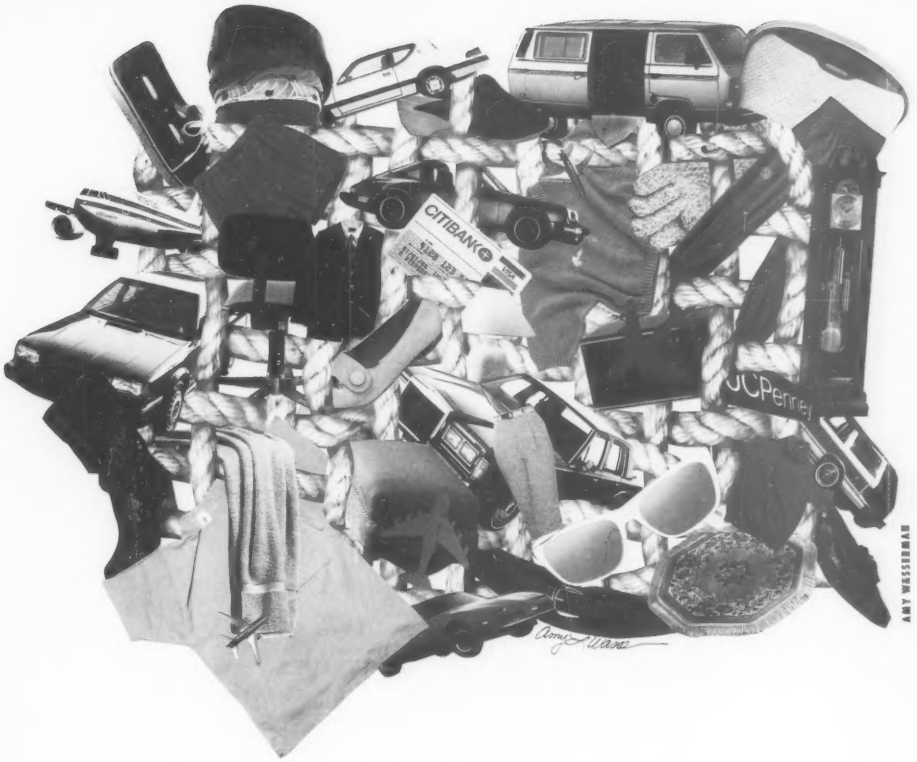
In Chicago, a traveler is handed the changed itinerary of her trip, including flight and train schedules and hotel reservations. It is not several days before her trip nor is she at a travel agency. She is at a United Airlines ticket booth at O'Hare, and she is ready to board her flight.

These are just a few examples of how advances in software and networking are making it easier and more practical for many companies to form strategic marketing and information technology alliances for mutual benefit.

Such alliances are often market driven and mostly temporary, taking advantage of opportunities that can be optimized only if both (or several) parties join forces. These are not mergers, and they rarely involve one company acquiring another. But with an increase in such strategic alliances, there is reason to believe that outright mergers and acquisitions will be a natural next step, according to Bill Davidson, a professor in the Graduate School of Business at the University of Southern California.

"There is a tendency to arrive at what I call code destiny," he says. By code destiny, Davidson is referring to the mutual software coding and programming that meshes partners' systems, making disengagement more difficult. It means tying business destinies with networking and application destinies. This, Davidson argues, makes more likely the merger of companies that start out as strategic allies.

Business opportunities, combined with economic factors, are making alliances more attractive. Instead of reinventing the systems wheel, alliance partners can leverage each other's technology for mutual benefit and synergy.



The arrangement between Citibank Visa and American Airlines is a classic example. American uses data from credit purchases made by Citibank Visa customers to grant them extra frequent-flier miles. Citibank Visa uses data from American's Sabre network to help it increase its customer base. It would have been foolish for American or Citibank to set up separate networks and marketing structures to combine the two industries. Leveraging each other's network and software expertise turned out to be a better choice.

Another example is Prodigy Services Co., a joint videotex venture between IBM and Sears, Roebuck and Co. For less than $10 a month, Prodigy subscribers with IBM Personal Computers or compatibles can access on-line home shopping and banking services from Sears.

The increasing speed and use of computer networks, the speed with which data can be managed by such tools as relational databases and the move to interchangeable network standards have made the integration of separate corporate computer systems more practical. In turn, integration is opening the window to new cooperative marketing and product development opportunities among companies.

Many of the organizations joining in such alliances, in fact, may often be competitors. Usually, such firms have decided that the possible exposure of business secrets to alliance partners is outweighed by the benefits of working together. Such a scenario is happening in Michigan among some rival engineering firms.

In the aftermath of the automotive market slowdown a few years ago, the Big Three automakers have been busy cutting fat out of their internal operations. The result is that the Big Three — General Motors Corp., Ford Motor Co. and Chrysler Corp. — have now decided to job out much of their automotive design and engineering work to outside firms.

In this feeding frenzy, however, many small engineering outfits are unable to compete with larger engineering and consulting firms. Michigan's Department of Commerce has stepped in to try to even the odds.

The department's Michigan Modernization Service set up the Flint River Project in 1988, a cooperative of several small Michigan engineering companies that have joined forces to do battle against their larger counterparts.

Ordinarily, these engineering firms would be at each other's throats competing in the high-risk engineering environment. By joining together, however, they reduce those risks and benefit against larger engineering firms.

"By linking their design and production capacities," explains John Cleveland, director of the service, "the [member] firms will be getting production efficiencies and an entry into more vertical [engineering] markets they might not be able to handle separately. The association will give them large-company clout with small-company creativity."

Quick turnaround

Initially, Cleveland says, the Flint River Project will exchange computer-aided designs (CAD), data and programming expertise to work on various projects for the Big Three automakers, defense contractors and other industries in Michigan. By pooling an inventory of engineering designs, project partners will be able to quickly turn around customized designs for potential clients.

The cooperative already has beaten out other large engineering firms for contracts. For example, Greece, Turkey and other allied countries have awarded the group contracts to replace aging parts for military vehicles.

The designs and products that come out of the cooperative will stay within the group; profits will be shared by the companies that have actually teamed for specific bids.

Second chance

Strategic alliances do not always involve companies coming together for the first time. Established alliances can also undergo profound changes as new opportunities arise from advances in networking and other computer technologies.

In Dallas, electronic data interchange (EDI) is changing retail giant J. C. Penney Co.'s relationship with its suppliers. EDI networking has been used for several years by the retail clothing chain to streamline the movement of material and payments, and the company has upped the number of suppliers on the network from 250 to more than 600.

Now J. C. Penney is experimenting with advanced color imaging systems over EDI to help the company quickly turn around fashion designs and clothes manufacturing with several suppliers overseas. The alliance will get new clothes into the U.S. market faster, where they will be sold under the J. C. Penney label.

USC's Davidson sees more such strategic alliances — or "coprocessing clusters," as he calls them — forming among U.S. businesses. There are going to be extensive networks in every business, Davidson reasons, and the core element of every business strategy is going to be its corporate networking strategy.

"Once you've decided what networking strategy you're going with, you've also chosen who you're going to do business with," Davidson says.

Take Galileo, a reservation system now being put in place by a consortium of 10 European and U.S. airline

MORE REASON TO 'CHARGE IT'

ADVANCES IN SOFTWARE and networking are bringing about some major changes in the credit card culture.

Technology has made possible such marketing alliances as the American Advantage program, which uses links between the Citibank Visa network and American Airlines' Sabre reservations network to enable Citibank Visa card holders to tally extra frequent-flier miles. Even the purchase of furniture or food at certain restaurants will boost a card holder's mileage under the Advantage alliance.

However, "where we really see networks benefiting our business is not in marketing but in customer service," says Bill Ahearn, a spokesman for Citibank. Ahearn points to Citibank's current arrangement with Federal Express to replace lost cards. Guaranteeing lost cards will be replaced within 24 hours, Citibank has established a network link between its computers and the computers of Federal Express. Together, the computers track the creation and shipment of new cards to customers through the Federal Express hub in Memphis.

AMERICAN'S ADVANTAGE *program offers frequent-flier miles to Citibank Visa users.*

Look for advances in computer technology to make for some unusual alliances in the credit card industry. The Genesis project at American Express, for example, will employ expert systems, relational databases and advanced networking to link together customer charge receipt data across the company's mainframes and minicomputers and create in-depth personality profiles of selected customers.

American Express will then take the data and work with restaurants, hotels, fashion establishments and other businesses to create personalized itineraries for its customers before trips, making the most of the customer's tastes — and credit.

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companies. It is an expensive system, costing more than $100 million to build, with enormous network and network management systems requirements, but the expenses will be spread across several companies. The consortium far transcends the ability of even large members, such as British Airways, to create competitive individual reservation systems.

Enabler, enforcer

Not only is technology an enabler, in certain cases it can also force companies to work together, claims F. Warren McFarlan, professor at Harvard University's Graduate School of Business Administration. For airlines today, it is essential to have some controlling interest in a reservation system such as Galileo, with its ties to hotels, resorts, credit cards and other businesses. Not to be involved in such an integrated system can put an airline in a tenuous business position.

McFarlan contends that one of the major reasons the ill-fated People's Express discount airline went under was its inability to match American Airlines' Sabre reservation system. American Airlines updated its system to enable it to price every airline seat independently. That, in turn, enabled American to discount those seats that competed directly with People's Express, undercutting People's prices.

The discount airline's system was not nearly as developed, and it made a quick exit into bankruptcy court. If People's Express had invested heavily in its own integrated reservation system, it might have beaten American at its own game.

Even the computer industry, one of the most intensely intracompetitive businesses, is looking at the benefits of strategic alliances.

For example, Cincom Systems, Inc., a software company in Cincinnati, has created a separate division to help identify and create strategic marketing alliances with other computer companies.

One of the most successful alliances Cincom has brought about, says Bill Dorsey, vice-president of Cincom's Strategic Alliances division, is the CIM Alliance, a band of eight manufacturing and hardware vendors that exchanges technology, information and joins together on major manufacturing bids.

Each CIM Alliance member, Dorsey claims, brings something to the computer-integrated manufacturing (CIM) table that no other single member possesses. For example, Litton Industries, Inc. brings with it integrated shop-floor manufacturing; Integraph brings CAD; Systonetics, Inc. brings project management; and Cyborg Systems, Inc. offers human resources and payroll planning.

Together, Dorsey says, the vendors can field the kind of complete CIM product and synergy lacking in even the largest computer manufacturing firms.

Today, because customers are more impatient and won't wait while a vendor develops a new technology, vendors are looking for technical and marketing help through alliances. ♦

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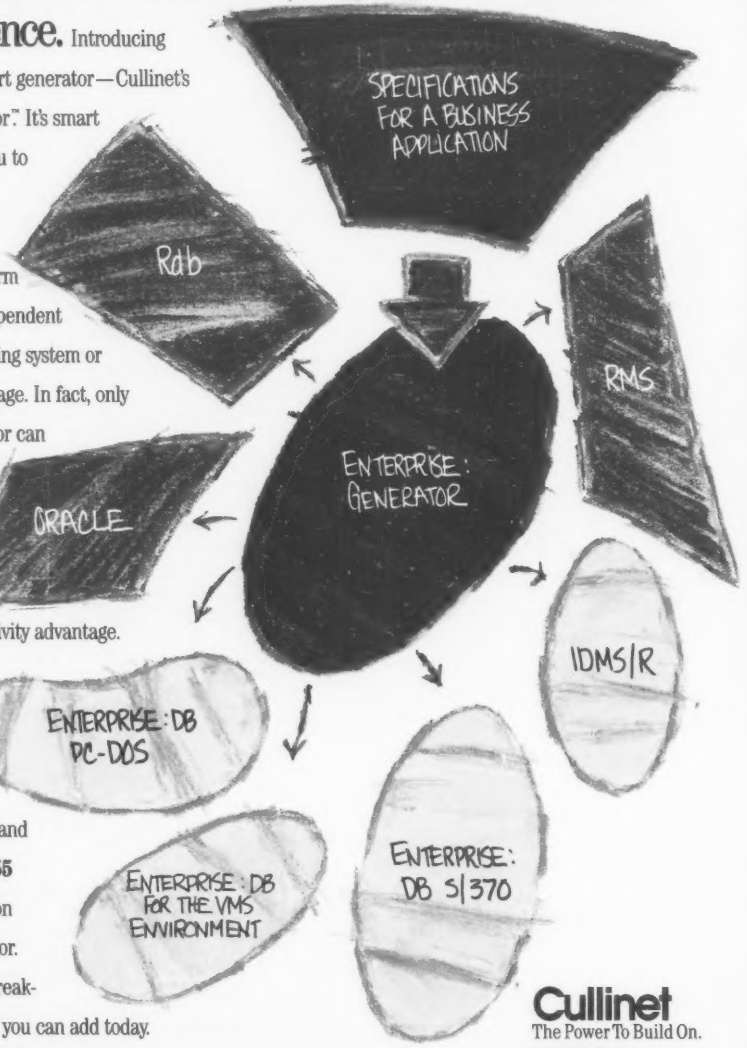

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BEATING THE b u g d e t BLUES

A GUY IN a pinstripe suit and wing tip shoes is in your office. He's asking you about the three Cs: cost reduction, cost containment and cost effectiveness. You cringe. You wince. You roll your eyes.

Drawing up a budget isn't what it used to be. At one time taken for granted, data processing operations have now become strategic information systems. What used to be a simple matter of networking expenditures has evolved into a full-blown mandate for integration.

It's not uncommon for the words "strategic" and "integration" to give rise to anxiety at IS budget time, observes Jerry Kanter, executive director of the Center for Information Management at Babson College in Wellesley, Mass. "Strategic information is a nebulous concept."

But if an information system manager knows what new kinds of data the applications are supposed to produce, Kanter says, or if he has alliances with senior managers who will support the IS budget as a means to achieve corporate goals, drafting a financial plan for integrating computer resources won't be a fearsome task.

Does that mean the tried-and-true budget formulas will work under the integration mandate? Not necessarily. And that can be a plus. As one IS executive describes it, his company's integration mandate made budget drafting more exciting because it prompted a whole new outlook.

"Integrating applications and hardware requires a different approach to how you fund things," says Tom Cochrane, director of information systems architecture and technology for Scott Paper Co., a multinational corporation that deals in coated paper and personal care and cleaning products.

Over a two-year period, the Philadelphia company went from the microeconomics of annual expenses to the macroeconomics of technology, he explains. Scott Paper took an approach based on individual economic models for each country in which it has a subsidiary. It tied its models to planned growth, utilization of technology and business forecasts.

"We're managing future costs instead of saying we're going to cut 5%," Cochrane says. "We've been working on our technology for a number of years so that this route would be doable."

Scott Paper has a mix of IBM 3090 mainframes and Personal System/2s, Digital Equipment Corp. midrange computers and Hewlett-Packard Co. machines. For communications, the company uses Ethernet in manufacturing, IBM's Token-Ring network in the office and IBM's Systems Network Architecture for wide-area networking.

As part of the macro technology approach to integration, Scott Paper redefined the role of its large processors to perform data and network management, its workstations to develop applications, its mid-range systems to direct manufacturing. Also, to save money, Scott Paper is shifting to internally developed, software-defined networks instead of leased lines, he adds.

Citing competitive reasons, Cochrane declines to reveal the percentage of cost savings. Instead, he explains the budget goal of "achieving a 25% annual rate of the utilization of technology and a manufacturing cost growth rate of 10% to 15%."

Customized where it counts

Now that Scott identifies the hardware platforms by function, the firm is focusing on "pure custom-built applications for sales and marketing," Cochrane adds. "Our focus is on custom development where we can get competitive advantage."

The name of Scott's profit game is market share — either maintaining it or increasing it — so it's easy to see why tailor-made applications are the way to win a greater portion. But instead of coming from a single source, data fed into these programs comes from a variety of platforms because of the buying patterns established years ago when each division purchased computers independently. Therefore, the budget grows in proportion to the amount and variety of data from the various divisions.

Customization takes a large piece of the budget pie for almost any organization. The difficult part of budgeting custom projects is that it is hard to figure just how large a piece of the budget they will take up.

"Certainly growing [an] integration project is taking up more of the MIS budget," says Hal Lockhart, a senior consultant at Technology Concepts, Inc., a Bell Atlantic Corp. subsidiary in Sudbury, Mass. He estimates that an integration project could cost between 10% and 25% of the overall conversion cost.

"It's tougher in the second round because the project becomes more involved with software development," he says, referring to customized applications. It is the first round that can be characterized as a cost saver because IS can see results in the first two years of an integration implementation, he adds.

Indeed, the first-time integration

PENNY-WISE, PC-FOOLISH

MANY EXECUTIVES VIEW integration as an expensive proposition, observes Marty Gruhn, vice-president of The Sierra Group, Inc., an information systems research concern in Tempe, Ariz.

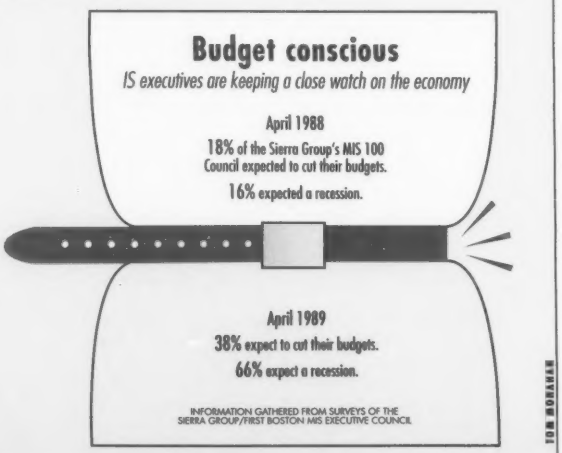
"If a recession hits, it could put a damper on innovative purchases," she explains. "IS executives will protect their mainframe investments but not their systems integration implementations. A halt will be put to purchases of PCs, LANs, file servers — all those innovative products and technologies associated with systems integration," she adds.

Gruhn bases her comments on regular monthly surveys of 150 top-level IS executives conducted by her company in cooperation with First Boston Corp., a New York investment bank.

"When there's a softness in their company's core business, MIS is going to cut the string," Gruhn explains about the scaling back of purchase plans by what she calls "the pinstripe MIS."

In recent surveys, Gruhn explains, these executives said they would drop personal computers and local-area networks from the short list if a recession hits because PCs are considered discretionary spending. Next to be curtailed, Gruhn says, are minicomputer purchases.

"They are committed to keeping up with mainframe enhancements," she emphasizes. And IS executives will continue to buy application development tools because they say getting rid of the backlog is very important to them, she adds.



budget may be the easiest to nail down. Call in your first vendor and say, "Prove it." Make vendors show you the cost benefits of their products. Cost justification is vital, especially if you're in an extremely cutthroat industry — like shipping.

David Beatty, IS director at Westwood Shipping Lines Co. in Seattle, will ship anything from antiques to boats to rocks. He was told to come up with an integrated plan that would tie in shipping agents in eight U.S. cities, Japan, Korea and 21 European offices in which cargo is secured, bills are paid and messages are sent and received — and to do it at the lowest cost.

Beatty budgeted for a gateway strategy that begins with a bridge between Westwood Shipping's IBM 3090 and a 10Net Communications' local-area network and then goes on to connect an IBM System/36 and a second 3090. The connection is made via a Trisystems Corp. 5250 bridge. Westwood Shipping also has communications gateways to an asynchronous electronic mail system from Tymnet/McDonell Douglas Network Systems Co. and a Gamma Fax facsimile card for fax machines.

Beatty estimates the gateway strategy allowed his firm to save $300,000 in its first year. "It eliminated a need for hardware redundancy," he explains, listing the big ticket items of tape backup systems, mainframe connections, hard drives, laser printers and modems.

The strategy fits neatly with Westwood Shipping's integration definition: "We let people share data and try to avoid rekeying the same information," Beatty explains.

Redundancy isn't restricted to hardware. It can also occur with data. Twice as much information doesn't always equal twice as much return on investment. In fact, too much of the same data may lower profits.

New heights of integration

Imagine a construction site. The buildings are nearly ready, save for the elevators you are there to install. But the cages are missing. Or maybe this time it's the floors. Manually inputting elevator design data into an front-office order-entry application can cause that to happen.

The solution? An integrated database.

At Westinghouse Elevator Co. in Morristown, N.J., that meant coming with with an integration plan that eventually came to be based on IBM's IMS, says Ed Hodgson, the company's manager of computing and communications. Between five and seven years ago, Westinghouse Elevator started to migrate to IMS, a remote access database done in batch mode.

Buying IMS was the easy part. But the firm "had to budget engineering and systems development people's time to write the interfaces," Hodgson says. That wasn't so easy.

Hodgson has a $4.5 million budget that used to run a mostly-IBM shop. "We work three years out and we try to keep everything plain vanilla because [new and proprietary] can kill you faster," he adds. And for good measure, Hodgson aims to justify budget items as a manager responding to user needs.

His is advice worth heeding when pulling together the numbers for a budget that will satisfy corporate and the IS integration mandate. The economic times will tell just how far you'll have to go to have quantifiable answers for the three Cs. ♦

RECESSION?! WHAT RECESSION?

YOU'VE READ ABOUT Wall Street's bulls and bears.

You've also read about monetarists and supply-siders.

Now, as you ready your integration budget, you can read about Old Wave and New Wave economics.

The New Wavers see a "cheerier course for the economy," says Dr. Edward Yardeni, chief economist for Prudential-Bache Securities in New York in his April 19 bulletin, "Money and Business Alert."

"Capacity is growing rapidly all around the world. As the supply side of the global economy expands, competition should intensify and should keep a lid on inflation," he explains.

Yardeni believes American as well as Japanese and European industrialists will boost their capital spending plans for the following reasons:

- The free trade movement is gaining momentum.
- Protectionism will spur plant construction abroad that, in turn, will also be an effort to counter volatile exchange rates.
- Employers are substituting capital for labor to yield greater productivity.
- Corporate alliances will spread in an effort to counter brutal global competition.
- Small and smart computers will be bought in shorter periods of time because technological innovation is occurring more rapidly.

Yardeni unabashedly admits, "I err on the side of upbeat."

Enter Dr. Walter Fackler of the Graduate School of Business at the University of Chicago. His is a more cautionary forecast about the future.

"There's a 50-50 chance of a recession by year end because the Federal Reserve Board is excessively worried about a recession," he states. In Fackler's mind, the Fed is "too restrictive and could tip us into the ditch" by imposing higher interest rates.

He sees the economy growing moderately, estimating the rate at between 2.5% and 3%.

Fackler, who's been forecasting for the business school for 25 years, claims he's been right for the last 11.

"I've changed my mind since last December when I didn't think we would have a recession," he says, adding that forcasting shouldn't be confused with predicting the future.

Forecasting, Fackler emphasizes, merely narrows the range of probabilities.

MARKET TWIST

Unix machines: Favorite among the net set

By Stan Kolodziej

Unix workstations have been on a roll lately. Unix, despite two warring camps, provides the closest thing the computer industry has to a standard multitasking operating system that is optimized for networking. And Unix workstations, predominantly using Motorola and reduced instruction set computing (RISC) processors, make ideal network servers.

No matter how you cut it, Unix workstations have been moving on all distribution fronts, even into the retailing channel. For further proof, consider the following examples:

• Businessland, long a bastion of MS-DOS and IBM Personal Computers, lost long-time customer and high flier Compaq and then surprised the industry by signing Steve Jobs and Next, Inc. to a long-term distribution contract. Next machines are Unix machines, sporting speedy Motorola processors and Mach, a high-powered Unix derivative licensed from Carnegie-Mellon University. IBM has declared that Mach will be an important network operating system to tie its RISC-based RT workstations together.

• In January, Intel did a complete 180-degree turn and introduced the I860, a full-fledged RISC processor. Only two months earlier, top Intel executives were assuring analysts and reporters (including myself) that the RISC workstation market was peripheral and "overpositioned." Now IBM is scrambling to place the fast I860 chip into the heart of its Personal System/2 line, which will be used as network servers on IBM local-area networks.

• Sun Microsystems has deemed mainstream commercial customers ready for its Scalable Processor Architecture machines. In April, the workstation wunderkind aimed its sales force and several new Unix units at the desktop market and will provide links with other networks through its Network File System.

• IBM has declared that AIX, its Unix version for workstations, is as strategically important to the company as its OS/2 operating system is in the PC arena. IBM will use software tools to optimize AIX use in multivendor environments.

• After years of downplaying Unix, DEC has let leak that it will introduce dedicated Unix workstations, aimed at the desktop, most likely this year. These machines will have links into Decnet.

You get the picture. Workstations are making a concerted bid for your time and your money. But this time, don't dismiss them as esoteric novelties, because they're bringing a lot more to the table.

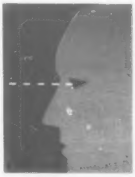
In light of this, Businessland's decision to carry Unix workstations is not so odd. In fact, it could be the next step for other commercial computer retailers.

COMPAQ LEFT *Businessland to the charms of Unix-based Next machines.*

CORNER OFFICE

Know what the left and right hands are doing

By Sarah B. Kaull



Information systems can help companies address the contemporary issues of quality, innovation, customer service and responsiveness. A new type of information system, the cross-functional system, can tie together the loosely connected parts of the business to form a coherent whole focused on a company's goals.

Examples of nonintegrated business functions abound. In the electronics industry, high quality is an imperative for doing business. One firm spent two months frantically searching for a debilitating quality problem that caused returns to pile up and customers to seek other suppliers. It traced the problem to the purchasing department; a new cleaning utensil, substituted by a supplier, was actually etching a sensitive part instead of gently cleaning it.

In the banking industry, most institutions still cannot assemble a complete picture of a customer's relationship with them because each department functions independently. High-tech firms have trouble building a global product because different countries have different accounting systems that do not communicate. In manufacturing firms, chasms still exist between marketing, production and purchasing; marketing sells what the customer needs, not what the company has, because the functions

continued on page 70

ACHIEVERS

An order for open systems at MacDonald's

By Stan Kolodziej

THE ISSUE
To build an architecture that will keep pace with MacDonald's aggressive business system plan.

THE SOLUTION
Plan an open systems and networking strategy that will enable MacDonald's to lessen its reliance on individual vendors and individual software programs.

PHOTOS: ROARK JOHNSON/GAMMA LIAISON

DOER'S PROFILE: CARL DILL
Outside affiliations: *Has helped the Second Harvest nationwide food bank operation computerize food distribution to 74 food banks.* **How he relaxes:** *He and his wife are "addicted" to golf and tennis. He likes to travel with his wife and two daughters.* **Last book read:** *Tom Peters'* Thriving on Chaos. *"It points out how to take advantage of a more demanding world."*

CARL F. DILL isn't afraid to take chances. In 1983, when most people still thought open systems meant plugging iron into IBM machines, this vice-president of information services at MacDonald's Corp. was already planning long-range network schemes that put a premium on standards over proprietary solutions.

In 1985, at a time when Unix was still considered an exotic and risky software venture within commercial computing, Dill, a seven-year veteran of the fast-food corporation, began using Unix as his networking software of choice.

One early star in Dill's push to open systems was the in-store processor (ISP), a networked Unix-based workstation that has been installed in about 75% of the 1,700 or so MacDonald's-owned restaurants nationwide. The ISP machines are AT&T workstations, with all software written in C.

The computers help restaurant managers perform cash and inventory management, ordering and crew labor scheduling, but that's only scratching the surface of possibilities, Dill claims. He calls ISP one of the "big drivers" of future advances in store automation at MacDonald's.

During the life of the ISP project, Dill has gone through three generations of hardware and vendors without having to change his base software investment.

He claims that with ISP, restaurant managers can save 30 to 40 hours of paperwork a week and cut some big inventory costs. More importantly, it keeps managers on the floor managing staff and serving customers instead of shuffling papers. "I like to think the company can now turn on a dime," he explains.

At a recent meeting on ISP for securities analysts, Dill says the initial response was an incredulous, "My God, they're not just selling hamburgers."

ISP is the first stage toward a smart data network that Dill sees linking MacDonald's restaurants and regional offices with its Oak Brook, Ill., headquarters and, eventually, with MacDonald's European locations.

Dill's smart network, which he calls a "concept network," will have an infrastructure of common service routines, and it will have software that is independent of screens and

continued on page 70

Networking ace drives toward excellence

Bob O'Rourke can talk about network links with the same ease he can talk about golf links. Like his boss Carl Dill, O'Rourke, the director of systems architecture at MacDonald's, is an avid golfer. And together, O'Rourke and Dill are setting a course for MacDonald's systems architecture through the 1990s.

"We have a pretty good understanding of what systems structure we want," says O'Rourke, an 11-year veteran at MacDonald's. "Now we're trying to get the hardware platforms and critical applications in place." One of those critical applications O'Rourke is currently working on is a network that will tie MacDonald's advertising people and distributors together.

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Donn Parker, Senior Management Systems Consultant, *SRI International*

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The interaction between systems and structure requires a workable balance between strategic control and freedom of access. This track provides an opportunity to analyze just how your IS plan and corporate business plan interrelate.

One of six session topics includes:

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Ron Brzezinski, Vice President, Information Systems, *Quaker Oats Co.*

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John Fisher, Senior Vice President, *Banc One Services Corporation*

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CLIPS

♦ *f r o m* ♦

HARVARD BUSINESS REVIEW

March-April 1989

Many companies need a new approach to information technology decision making, one that blends the technical knowledge of the computer experts with the vision of senior management. One way is to establish a task force that solicits input from top management and creates a set of principles to guide subsequent investments in IT. The task force translates the language of corporate strategy into computerese.

From "How executives can shape their companies' information systems" by Thomas H. Davenport, Michael Hammer and Tauno J. Metsisto.

♦ *f r o m* ♦

THE AMOS TUCK SCHOOL OF BUSINESS (DARTMOUTH)

March 1989

Managerial prestige — employing executives with an elite educational background, financial and boardroom clout and political influence — may be the key behind some firms' ability to come through financial trouble. Why? Because the public perception is that prestigious people are credible, powerful, trustworthy, resourceful individuals who can use these traits to turn around a firm's financial situation. In failing firms, there is a bailout by such "hot-shot" managers, lessening the prestige and credibility of the remaining management team.

From "Top managerial prestige and organizational bankruptcy" by Richard A. D'Aveni.

♦ *f r o m* ♦

UNIVERSITY OF CHICAGO SCHOOL OF BUSINESS

Selected paper No. 68

Compensation need not be linked directly to output to motivate staff. Rather, workers should be judged relative to one another. But there is a disadvantage to judging individuals on how they do when compared with others: A worker does well not only by making himself look good but also by making his rival look bad. (Remember Dukakis and Bush?) One way to mitigate this problem is by setting up a structure in which rivalry exists only among those who need not cooperate.

From "Enhancing productivity through compensation" by Edward P. Lazear.

♦ *f r o m* ♦

CALIFORNIA MANAGEMENT REVIEW

Winter 1989

The European Community has set the goal of a united Europe by 1992. The EC's conviction is that united Europe's survival as an economic and scientific world power will depend on its success in establishing a world-class telecom industry. The EC wants to replace separate analog and digital transmission systems for voice and data, respectively, with a single integrated digital network that will carry voice, data, text and images. Key to this effort is ISDN.

From "Europe 1992 — Opportunity or threat for U.S. business: The case of telecommunications" by Alfred L. Thimm.

♦ *f r o m* ♦

THE WHARTON SCHOOL

Winter 1987

Organizations that are successful at new business development employ divisional CEOs whose behavior promotes such entrepreneurship. Throughout their divisions, these CEOs inspire pervasive commitment to new business development and build confidence in subordinates' ability to develop new businesses and manage failure well.

From "New business development: A challenge for transformational leadership" by Ian MacMillan.

♦ *f r o m* ♦

SLOAN MANAGEMENT REVIEW

Picking the right people and fostering their development in the right way makes for better subordinates. Here, "development" means using jobs and task assignments to test and strengthen junior managers' weaknesses and prepare the best of them to run the company.

From "Chutes and ladders: Growing the general manager" by Thomas V. Bonoma and Joseph C. Lawler.

♦ *f r o m* ♦

CALIFORNIA MANAGEMENT REVIEW

Winter 1989

To sustain a competitive advantage, a company needs to concentrate on its assets and skills. An asset is something a business possesses, such as a brand name or retail location, that is superior to what the competition has. A skill is something a business does, such as advertising, that is better than what the competition is doing.

From "Managing assets and skills: The key to a sustainable competitive advantage" by David A. Aaker.

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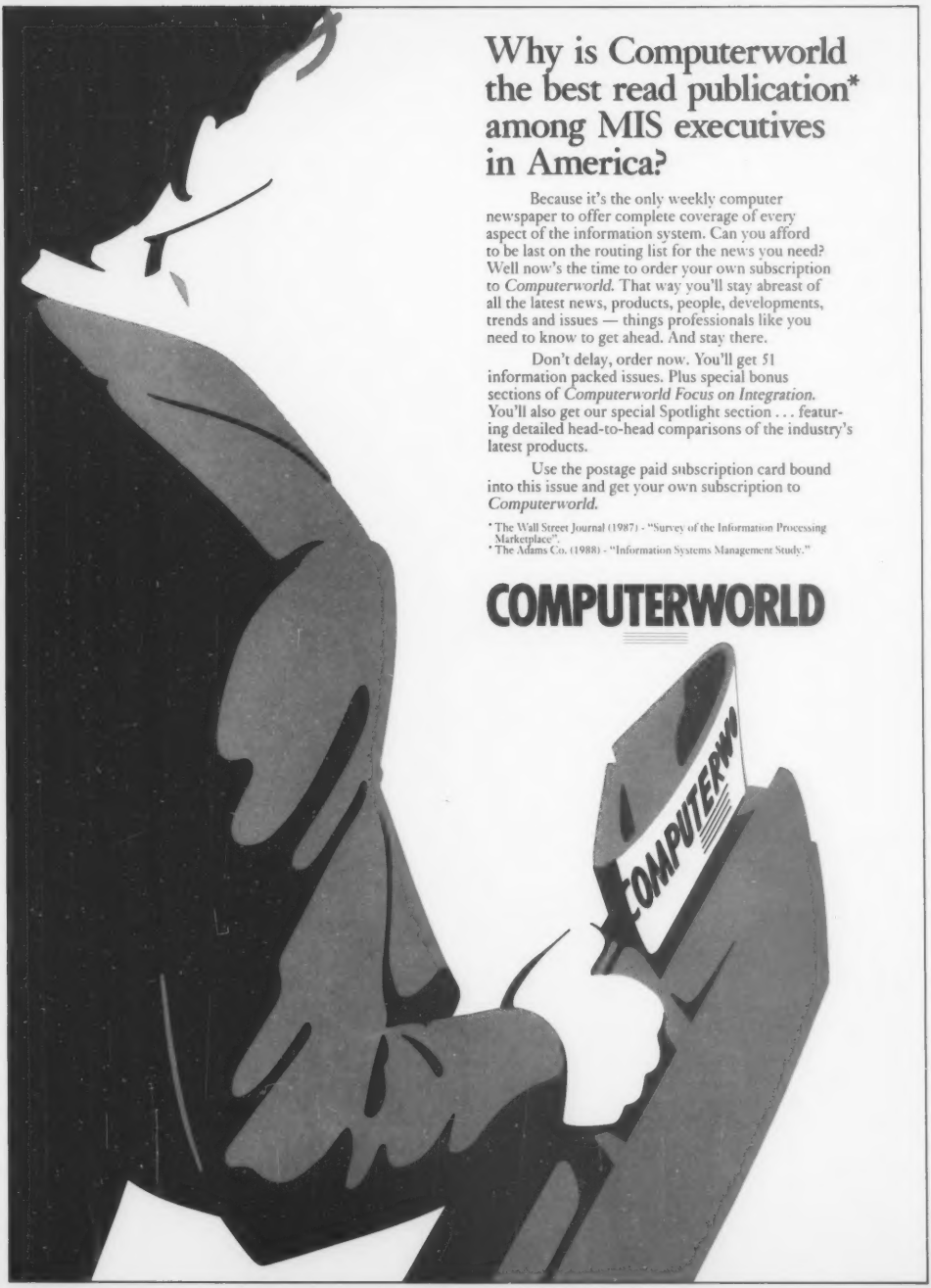

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* The Wall Street Journal (1987) - "Survey of the Information Processing Marketplace".
* The Adams Co. (1988) - "Information Systems Management Study."

COMPUTERWORLD

CROSS SECTION

Are you planning to install more PC LANs? Why?

We asked the question above of IS professionals around the country. It seems the quest for connectivity is continuing, with a few detours here and there. Take a moment to compare their LAN plans to your own.

"We're budgeted to buy our first one, for the development group. We're sophisticated but not leading edge. We like to know that it works first."
TIMOTHY KENNEY
MANAGER OF OPERATIONS AND CLIENT SUPPORT
SYSTEMETRICS/ MCGRAW-HILL
SANTA BARBARA, CALIF.

"We're actually planning to buy fewer PC LANs because of a reduction in overall staff."
RON MASON
MIS DIRECTOR
TEXAS CITY REFINING
TEXAS CITY, TEXAS

"Yes. We're putting PC LANs in more remote locations to increase efficiency in those location and to get them connected."
ROBERT THRASHER
IS MANAGER
PACIFICORP FINANCIAL SERVICES
PORTLAND, OREG.

"We're getting ready to install our first PC LAN to connect the machines in accounting and set up a departmental database. We want to eliminate sneakernet, which is the way we share data now."
LEON ALLEN
MIS DIRECTOR
NARDA MICROWAVE CORP.
HAUPPAUGE, N.Y.

"Yes. We're almost at 100% now [with workstations]. They'll need to share data in a work group environment. PC LANs are the technology to do that."
DAVID HERSH
MANAGER PSG SYSTEMS DEVELOPMENT AND SERVICES
AIR PRODUCTS & CHEMICALS, INC.
ALLENTOWN, PA.

"We're getting fewer PC LANs. We've established everything we need in terms of PC LANs."
RALPH WARREN
MIS COORDINATOR
BALMAR PRINTING & GRAPHICS, INC.
ARLINGTON, VA.

CORNER OFFICE

Continued from page 65

do not talk to each other.

In each of the above examples, the business challenges can be addressed by information systems that cross organizational boundaries to link key parts of the business. How can IS executives identify opportunities for these cross-functional systems? They can look for the following triggers:

- Long, sequential processes with limited feedback. In many cases, there is a need for coherence and linkage. For example, many companies have developed systems to connect the many steps of order processing and accounts receivable.
- Intensive information transfer or exchange. These activities are a substitute for a natural connection.
- Multiple points of external contact. This invites inconsistency. Banks have responded to this problem with customer information databases.
- Tight feedback loops. This is a sign of breaking up functions unnaturally. Some firms are moving to integrate dependent functions such as purchasing and quality assurance.
- Ad hoc organizational structures such as task forces or coordinators. Companies should make these activities regular, with systems providing the organizational framework.

Identifying and implementing cross-functional systems is hard work. But the payoffs in terms of streamlining, simplification and achievement of important business goals can be tremendous.

KAULL *is the associate director of the Partnership for Research in Information Systems Management (PRISM), a joint venture of the Index Group, Inc. and Hammer & Co. PRISM, in Cambridge, Mass., does research for sponsors from Fortune 200 corporations.*

ACHIEVERS

Continued from page 65

that runs freely across applications and processors.

"We want to protect the application from its environment," Dill explains. If he has his way, that environment will be completely open and integrated in applications, data, communications, hardware, software and IS human resources. The Integrated Services Digital Network, which will integrate voice and data, is expected to be a part of the smart network in the 1990s, Dill says.

But some things, Dill is certain, will never change at MacDonald's. Every so often, for example, key management people from MacDonald's top computer vendors still enter the company's restaurants to get a ground-level view of the operation. And they do it the old fashioned way: slinging burgers.

next

Your concerns concern us. *That's why we've made available our bulletin board. You can contact us at 508-626-0165 about integration hassles, successes, failures, ideas. See you August 7 with more integration strategies.*

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log off

On the road

JUST DESERTS The day before Comdex/Fall, I was behind the wheel of the last vehicle rented in Las Vegas having a conversation with a marcom guy from a computer company. Tooling around 2,000 acres of a national wildlife refuge in a GMC Suburban searching for red-tailed hawks and looking at limestone formations wasn't a guarantee that work wouldn't come up in the conversation.

Even though Comdex is long past, the discussion is worth recalling because the information industry is facing a revolution that will create a new data order. If you aren't sure what "data order" means, but if, as a concept, it causes the kind of chills that "strategic systems" does, read on.

This marketing bloke has a background in computer-aided design. He's also hyped motorcycles at one point in his career, so he knows how to answer customer demands. He puts forth and believes it to be an imperative for economic survival that U.S. companies place the design work of engineers squarely in the center of their corporate data banks.

Sales and marketing isn't the be-all and end-all; it shouldn't be the king of IS's operations, and it alone won't lead a company (or a country) out of a deficit spiral and into profitability. This is the era of getting close to the customer. Putting technical talent near to the heart of what generates income will make companies more appealing to customers.

And I agree with him.

But I'm an inquisitive reporter, so I had to ask the questions: How is this rearrangement of data priorities going to go over with the traditional IS professional? Won't there be a turf war between design and marketing over whose data gets top billing? Who's going to manage it? Who's going to mediate it?

And then I wondered, why so many questions? An obvious answer seems to be to integrate the technical and marketing databases.

Revolutions affect everyone sooner or later. Those IS executives who realize the larger business implications of this new data order are in the best position to integrate the opposing sides before they dissolve into warring factions. Usually it's best to affect the necessary changes rather than being effected by them. — By Helen Pike

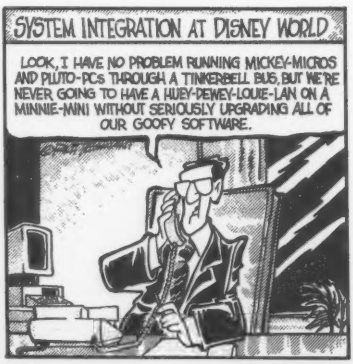
Next wave

We knew it was bound to happen: ISDN servers. The first wave of them is expected to come from Europe. One boasts simultaneous access to voice and data for up to 100 users at 64K bit/sec., up to 20G bytes of storage and duplicate applications on a digital optical disk.

Getting kind of crowded in the bottleneck? Researchers are looking to create a hall of mirrors in place of a bus to speed the transmission of data to the CPU. The result would be an optical computer. One using prisms, mirrors and lenses is currently under design at AT&T Bell Laboratories.

In the incredible shrinking computer department: Atari Corp. has unveiled an IBM Personal Computer-compatible machine that is about the same size as a videocassette and weighs 1 lb. The Portfolio comes with 128K bytes of memory, expandable to 640K bytes.

There are some differences, however. The keyboard is a miniaturized version of the standard Qwerty keyboard, and instead of disk drives, the Portfolio uses credit card-size program and memory cards.



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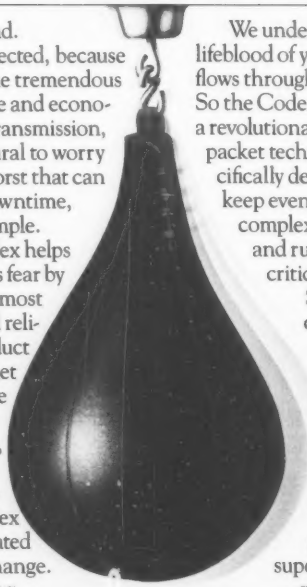

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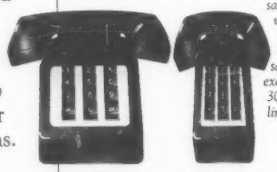

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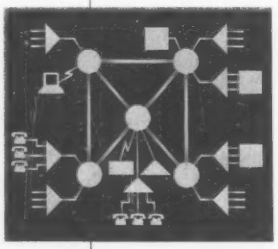

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